DOCUMENT RESUME

ED 361 472 CE 064 321

AUTHOR	Redmann, Donna H., Ed.
TITLE	AERA Vocational Education Special Interest Group Proceedings. American Educational Research Association Annual Meeting (Atlanta, Georgia, April 12-16, 1993).
PUB DATE	Apr 93
NOTE	407p.
PUB TYPE	Collected Works - Conference Proceedings (021)
EDRS PRICE	MF01/PC17 Plus Postage.
DESCRIPTORS	Agricultural Education; Cooperative Education; Cooperative Programs; Displaced Homemakers; *Educational Research; Employment Level; Job Satisfaction; Outcomes of Education; Postsecondary Education; Secondary Education; Statistics; *Vocational Education
IDENTIFIERS	Concept Mapping

ABSTRACT

This conference report contains the following 18 papers: "State Policies and State Vocational Education Director Perceptions Pertinent to Career-oriented Education in the Middle Grades" (Barrick, Hughes); "Complying with Perkins: Using Existing Tests To Measure Academic Gains for Vocational Education Students" (Bergstrom, Gershon); "Teachers' Roles in Integrating Academic and Vocational Education: A Conceptual Framework" (Finch, Schmidt, Faulkner); "The Long Term Effects of Secondary and Postsecondary Educational Attainment on Yearly Earnings: Is Gender an Issue?" (Gray); "Limitations on Local Accountability in Vocational Education" (Hanser, Stecher); "A Mosaic of Diversity: Vocationally Undecided Students and the Perry Scheme of Intellectual and Ethical Development" (Jones, Newman); "Dropout in Senior Secondary Vocational Education" (Lokman); "Redirecting Secondary Vocational Education toward the 21st Century" (Lynch, Smith, Rojewski); "The Impact of Vocational Training and Employment during Secondary School on Postsecondary Outcomes of SED [Serious Emotional Disturbances] Graduates" (McCall, Burns, Zigmond); "Life Cycles of Attainment Targets for Job-Related Curricula" (Mulder, Laret, Maslowski); "Using Concept Mapping Techniques to Compare Stakeholder Groups' Perceptions of Tech Prep" (Roegge et al.); "Variables that Predict Level of Job Satisfaction and Intent To Leave Present Employment among Secondary Teachers of Vocational/Technical Education in the United States" (Tanner, Warr); "Comparison of the Perceptions of Displaced Homemaker Program Clients and Administrators in Louisiana" (Trott, Burnett, Holden); "The Determination of Statistical Sophistication of Research in Vocational Education" (Zhang); "Vocationalism and Social Efficacy: The Chinese Model" (Zhang); "Reconceptualizing Vocational Education with Concept Mapping" (Bragg, Harmon); "Survey of Teachers' Implementation and Perception of Agriscience and Natural Resource Curriculum" (Conners, Elliot); and "Cooperative Vocational Education" (Stone et al.). (KC)

ED 361 472

AERA

VOCATIONAL EDUCATION
SPECIAL INTEREST GROUP

PROCEEDINGS

American Eductional Research Association

1993 Annual Meeting

Atlanta, Georgia

April 12-16, 1993

U S DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it

☐ Minor changes have been made to improve reproduction quality

---

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

D Redmann

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

CE 064 321

Donna H. Redmann
SIG Program Chair and Proceedings Editor
Louisiana State University

BEST COPY AVAILABLE

NOTES FROM SIG PROGRAM CHAIR

The 1993 American Educational Research Association (AERA) Annual Meeting was held in Atlanta, Georgia, April 12-16. The AERA Vocational Education Special Interest Group (SIG) had four paper presentation sessions, one round table session, and a business meeting. A copy of the SIG program agenda is provided on page v. The 19 papers presented were selected through a blind, peer refereed process. There were a total of eight reviewers, with each proposal being read by three reviewers. The 15 papers contained herein are from authors who wished to have their papers published in this Proceedings and also submitted them within the designated time frame.

Donna H. Redmann

Donna H. Redmann, Program Chair and Proceedings Editor
Vocational Education SIG
1993 AERA Annual Meeting

For further information, contact:

Donna H. Redmann, Ph.D.
School of Vocational Education
Louisiana State University
Baton Rouge, Louisiana 70803

(504) 388-5748

TABLE OF CONTENTS

Notes from SIG Program Chair ii

Vocational Education SIG Program v

Paper Presentations:

State Policies and State Vocational Education Director Perceptions Pertinent to Career-oriented Education in the Middle Grades. *R. Kirby Barrick, Matthew Hughes, Ohio State University* 2

Complying with Perkins: Using Existing Tests to Measure Academic Gains for Vocational Education Students. *Betty Bergstrom, Richard Genshon, Computer Adaptive Technologies* 10

Teachers' Roles in Integrating Academic and Vocational Education: A Conceptual Framework. *Curtis R. Finch, B. June Schmidt, Susan L. Faulkner, Virginia Polytechnic Institute and University* 22

The Long Term Effects of Secondary and Post-Secondary Educational Attainment on Yearly Earnings: Is Gender an Issue? *Kenneth Gray, The Pennsylvania State University* 35

Limitations on Local Accountability in Vocational Education. *Lawrence M. Hanser, Brian M. Stecher, RAND* 51

A Mosaic of Diversity: Vocationally Undecided Students and the Perry Scheme of Intellectual and Ethical Development. *Hedy J. Jones, Isadore Newman, University of Akron* 75

Dropout in Senior Secondary Vocational Education. *Ineke Lokman, University of Groningen, The Netherlands* 94

Redirecting Secondary Vocational Education Toward the 21st Century. *Richard L. Lynch, Clifton L. Smith, Jay W. Rojewski, University of Georgia* 112

The Impact of Vocational Training and Employment During Secondary School on Postsecondary Outcomes of SED Graduates. *Roseanne McCall, Dorothy Burns, Naomi Zigmond, University of Pittsburgh* *130*

Life Cycles of Attainment Targets for Job-Related Curricula. The Difference Between Pre-Service and In-Service Vocational Education. *Martin Mulder, Charlotte Laret, Ralph Maslowski, University of Twente, The Netherlands* *168*

Using Concept Mapping Techniques to Compare Stakeholder Groups' Perceptions of Tech Prep. *Chris A. Roegge, Tim L. Wentling, James A. Leach, Dan C. Brown, University of Illinois at Urbana-Champaign* *178*

Variables That Predict Level of Job Satisfaction and Intent to Leave Present Employment Among Secondary Teachers of Vocational/Technical Education in the United States. *C. Kenneth Tanner, University of Georgia; Charles N. Warr, Fayette County, Georgia Public Schools* *191*

Comparison of the Perceptions of Displaced Homemaker Program Clients and Administrators in Louisiana. *James W. Trott, Jr., Michael F. Burnett, A. Mark Holden, Louisiana State University* *248*

The Determination of Statistical Sophistication of Research in Vocational Education. *Chi Zhang, University of Delaware* *261*

Vocationalism and Social Efficacy: *The Chinese Model. Chi Zhang, University of Delaware* *295*

Reconceptualizing Vocational Education With Concept Mapping. *Debra D. Bragg, University of Illinois at Urbana-Champaign, and C. Michael Harmon, University of Illinois* *316*

Survey of Teachers' Implementation and Perception of Agriscience and Natural Resource Curriculum. *James J. Conners and Jack Elliot, University of Arizona* *363*

Cooperative Vocational Education: What Works? *James R. Stone III, University of Minnesota; David Stern, University of California-Berkeley; Charles Hopkins, University of Minnosota; Martin McMillion, Virginia Tech* *374*

Vocational Education SIG Program
1993 AERA Annual Meeting
Atlanta, Georgia
April 12-16, 1993

Session Title: **Career Preparation in Vocational Education**
ID No.: S-100-5 -- Session No. 6.29

Date/Time: Monday, April 12, 4:05-6:05
Location: Hyatt, Strauss Room, Exhibit Level

Chair/Discussant: Robert L. Fritz, University of Georgia

Participants:

The Impact of Vocational Training and Employment During Secondary School on Postsecondary Outcomes of SED Graduates. Roseanne McCall, Dorothy Burns, Naomi Zigmond, University of Pittsburgh

The Role of Family in Educational and Occupational Decisions made by Mexican-American Students. Gonzalo Garcia, Kay Clayton, Stephen Sivo, Texas A&M University

Dropout in Senior Secondary Vocational Education. Ineke Lokman, University of Groningen, The Netherlands

State Policies and State Vocational Education Director Perceptions Pertinent to Career-oriented Education in the Middle Grades. R. Kirby Barrick, Matthew Hughes, Ohio State University

The Determination of Statistical Sophistication of Research in Vocational Education. Chi Zhang, University of Delaware

Session Title: **Vocational Education Reform: Reconceptualization, Redirections, and Accountability**
ID No.: S-100-2 -- Session No. 16.15

Date/Time: Tuesday, April 13, 12:25-1:55
Location: Marriott, Madrid Room, 2nd Level

Chair/Discussant: Larry R. Arrington, University of Florida

Participants: Reconceptualizing Vocational Education with Concept Mapping. Debra D. Bragg, C. Michael Harmon, University of Illinois at Urbana-Champaign

Redirecting Secondary Vocational Education Toward the 21st Century. Richard L. Lynch, Clifton L. Smith, Jay W. Rojewski, University of Georgia

Limitations on Local Accountability in Vocational Education. Lawrence M. Hanser, Brian M. Stecher, RAND

Session Title: **Research in Vocational Education: Roundtables**
ID No.: S-100-6 -- Session No. 20.03

Date/Time: Tuesday, April 13, 4:05-6:05
Location: Marriott, Salon A, 2nd Level

Chair: Wanda L. Stitt-Gohdes, University of Georgia

Table 1: Survey of Teachers' Implementation Perceptions of Agriscience and Natural Resources Curriculum. James J. Connors, Michigan State University; Jack Elliot, University of Arizona

Table 2: Life Cycles of Attainment Targets for Job-Related Curricula. The Difference Between Pre-Service and In-Service Vocational Education. Martin Mulder, Charlotte Laret, Ralph Maslowski, University of Twente, The Netherlands

Table 3: Vocationalism and Social Efficacy: The Chinese Model. Chi Zhang, University of Delaware

Table 4: A Comparison of the Perceptions of Displaced Homemaker Program Clients and Administrators in Louisiana. James W. Trott, Jr., Michael F. Burnett, A. Mark Holden, Louisiana State University

Table 5: A Mosaic of Diversity: Vocationally Undecided Students and the Perry Scheme of Intellectual and Ethical Development. Hedy J. Jones, Isadore Newman, University of Akron

Session Title: **Vocational Education Work Experience: Job Satisfaction, Earnings, and Supervised Work Experience**
ID No.: S-100-4 -- Session No. 25.56

Date/Time: Wednesday, April 14, 8:15-9:45
Location: Hyatt, Italian Suite, Exhibit Level

Chair/Discussant: Marcia A. Anderson-Yates, Southern Illinois University at Carbondale

Participants: The Long Term Effects of Secondary and Post-Secondary Educational Attainment on Yearly Earnings: Is Gender an Issue? Kenneth Gray, The Pennsylvania State University

Variables That Predict Level of Job Satisfaction and Intent to Leave Present Employment Among Secondary Teachers of Vocational/Technical Education in the United States. C. Kenneth Tanner, University of Georgia; Charles N. Warr, Fayette County, Georgia Public Schools

Cooperative Vocational Education: What Works? James R. Stone, III, Charles Hopkins, University of Minnesota; David Stern, University of California-Berkeley; Martin McMillion, Virginia Polytechnic Institute and State University

Session Title: **Vocational Education and Academic Skills: Teachers' Roles, Measuring Academic Gains, and Technical Preparation**
ID No.: S-100-3 -- Session No. 30.15

Date/Time: Wednesday, April 14, 12:25-1:55
Location: Marriott, Quebec Room, 2nd Level

Chair/Discussant: Randy L. Joyner, East Carolina University

Participants: Teachers' Roles in Integrating Academic and Vocational Education: A Conceptual Framework. Curtis R. Finch, B. June Schmidt, Susan L. Faulkner, Virginia Polytechnic Institute and University

Complying with Perkins: Using Existing Tests to Measure Academic Gains for Vocational Education Students. Betty Bergstrom, Richard Genshon, Computer Adaptive Technologies

Using Concept Mapping Techniques to Compare Stakeholder Groups' Perceptions of Tech Prep. Chris A. Roegge, Tim L. Wentling, James A. Leach, Dan C. Brown, University of Illinois at Urbana-Champaign

Session Title: **Vocational Education Research Membership Meeting**
ID No.: S-100-1 -- Session No. 35.29

Date/Time: Wednesday, April 14, 6:15-7:45
Location: Hyatt, Italian Suite, Exhibit Level

President: Curtis R. Finch, Virginia Polytechnic Institute and State University

Program Chair: Donna H. Redmann, Louisiana State University

PAPERS PRESENTED

STATE POLICIES AND STATE VOCATIONAL EDUCATION DIRECTOR PERCEPTIONS PERTINENT TO CAREER-ORIENTED EDUCATION IN THE MIDDLE GRADES

R. Kirby Barrick, Professor & Chair
Matthew Hughes, Graduate Research Associate
Department of Agricultural Education
The Ohio State University

STATE POLICIES AND STATE VOCATIONAL EDUCATION DIRECTOR PERCEPTIONS PERTINENT TO CAREER-ORIENTED EDUCATION IN THE MIDDLE GRADES

R. Kirby Barrick, Professor & Chair
Matthew Hughes, Graduate Research Associate
Department of Agricultural Education
The Ohio State University

Introduction

Early adolescence is the life stage from about 10 to 14 years of age and is characterized by many physical, psychological, social, cognitive, and vocational developmental changes. Because of these changes, the early adolescent has unique educational needs for which middle-grade (grades six through eight) schools were established. The number of career-oriented programs has increased at the middle-grade level in recent years (Alexander & McEwin, 1989). However, career-oriented curricula have been criticized for not meeting the educational needs of the middle-grade student (Beane, 1990; Harrington-Lueker, 1990). The continued development of career-oriented programs at the middle-grade level depends greatly upon the effectiveness of the programs and the support of state-level education agency officials.

Career-oriented education was defined for this study as planned course work and activities designed to provide students one or more of the following attributes: a) ability to assess occupational aptitude, b) entry-level job skills, c) practical skills (e.g., basic home repairs, "life skills"), d) career awareness, e) knowledge needed to select future course work based on career interests, and f) opportunity to relate education to career roles. Program areas in career-oriented education include agriculture, business, general career education, health occupations, home economics, marketing and distribution, technology, and trade and industrial (T&I). Although career-oriented concepts are often taught in specific courses, recent recommendations for education reform emphasize the need for incorporating the concepts throughout the curriculum as a means of strengthening the connection between education and work (Secretary's Commission on Achieving Necessary Skills, 1991).

Middle-grade curricula and student activities should be based on the needs and characteristics of early adolescents. An important task of middle-grade education is to help students develop social skills (Lipsitz, 1984). Middle-grade schools should provide early adolescents an understanding of various career roles in society (Carnegie Council on Adolescent Development, 1989); however, Sale (1979) emphasized that job training is not an appropriate function of the middle grade curriculum. Early adolescents need opportunities to learn through hands-on experiences, acquire commonly-used practical skills, and develop a set of personal values (Kindred, Wolotkiewicz, Mickelson, Copenlin, & Dyson, 1976; Curtiss & Bidwell, 1977; Greenberg & Hunter, 1982).

Student organizations play an important role in early adolescent education. Middle-grade student organizations provide means of extending the curriculum, exploring personal and career interests, and developing social and leadership skills (Kindred et al., 1976; Miller, 1988). Because of wide variations in the developmental levels among early adolescents, it has been State recommended that participation take precedence over competition in the middle grades (Brazee & Smalley, 1982). Rossetti, Padilla, and McCaslin (1992) recommended that the National FFA Organization not develop competitive activities at the national level for middle-grade members. However, George (1988) pointed out that there are benefits of competition among students in the middle grades.

Beliefs of administrators within an educational organization influence decisions affecting the programs and philosophy of that organization (Boyle, 1981). Essential to developing and improving career-oriented programs at the middle-grade level was information on the current status of the programs and knowledge of how the programs are perceived and supported by state education agency officials. However, this information was not available from states.

Purpose and Objectives

The reported research is part of a larger study designed to determine the status of career-oriented education programs at the middle-grade level and relevant perceptions of state education agency officials who have responsibilities in the program areas. The objectives pertain to career-oriented education and vocational student organizations (VSOs) at the middle-grade level only. Objectives which guided the reported research were:

1. to describe career-oriented education in terms of: a) prevalence and courses offered; and
2. to determine the perceptions of state directors of vocational education regarding: a) vocational education agency support for middle-grade career-oriented education; b) past and future growth of career-oriented programs; c) the role of career-oriented education in the middle grades; e) the role of VSOs in the middle grades; f) the degree to which career-oriented education can contribute to the vocational, values, intellectual, and social development of early adolescents; g) appropriate courses for delivering career-oriented concepts in the middle grades; and h) competition within middle-grade VSOs.

Procedures

A census of state directors of vocational education (N=50) was conducted using mailed survey instruments. The instruments consisted of close-ended and partially close-ended items. Nine items were measured on a six-point Likert-type scale (1=strongly disagree to 6=strongly agree). The directors could provide more than one response on several items.

Instrument validity was assured through a review and revision process involving graduate students in agricultural education and in the Comprehensive Vocational Education programs at The Ohio State University. Reliability was determined by a test/retest procedure involving teacher educators in vocational education and current and former administrators in the Ohio Division of Vocational and Career Education. The overall percentage of agreement from the test/retest was .93 and ranged from .66 to 1.00 on individual items.

After follow-up mailings to nonrespondents, 43 (86%) directors returned usable instruments. To account for response error in the overall study, 10 (14%) nonrespondents were contacted by phone and asked selected questionnaire items. Their answers were compared to those of the respondents with a t-test, and no statistically significant differences were found at alpha .05. Therefore, the responses received were generalized to the populations.

Results

Over 80% of the directors indicated that middle-grade students were enrolled in career-oriented programs in their states. Most directors reported that middle-grade students were enrolled in home economics, agricultural education, and business; almost one-half reported that middle-grade students were enrolled in general career education (Table 1).

Table 1

Directors Indicating Middle-grade Students Enrolled in Career-oriented Education Programs (N=42)

Program	Responses f	Responses %
Home Economics	30	71
Agriculture	25	59
Business	21	50
General Career Education	20	48
Technology Education	16	38
Trade & Industrial	12	29
Health Occupations	7	17
Marketing/Distribution	6	14
Other	1	3

Over three-fourths of the directors indicated that their state vocational education agencies encouraged career-oriented courses at the middle-grade level. No directors reported that the courses were discouraged.

Almost one-half of the directors who reported that middle-grade students were enrolled in career-oriented programs indicated that the number of programs increased in their states over the past 10 years; 18% indicated that the number had decreased. Most directors indicated that the number will increase over the next 10 years; 10% indicated that the number will decrease.

A majority of the directors indicated that the role of career-oriented education at the middle-grade level should include providing students opportunities for: a) exploration of careers, b) assessment of occupational aptitudes, c) exploration of personal interests, and d) application of knowledge through hands-on activities. Over one-half indicated that the role should include guiding students toward a high school vocational curriculum. Most directors reported that the role of middle-grade VSOs should include helping students develop leadership and social skills as well as providing opportunities for the exploration of personal interests.

Table 2 presents results from the Likert-type scale segment of the questionnaire. The table shows that the directors tended to agree (indicated by mean ratings of 4.50 to 5.49) that career-oriented courses can: a) help middle-grade students understand the world of work, b) help middle-grade students develop their personal values, and c) contribute to the intellectual, social, and vocational development of middle-grade students. The directors also tended to agree that the concepts of career-oriented education should be incorporated into middle-grade core courses (language arts, history, social studies, science, mathematics). The directors tended to somewhat agree (indicated by mean ratings of 3.50 to 4.49) that: a) the concepts of career-oriented education should be taught in specific career-oriented courses, and b) team competition should be an important part of middle-grade VSOs. The directors tended to somewhat disagree (indicated by mean ratings of 2.50 to 3.49) that individual student competition should be an important part of middle-grade VSOs.

Implications and Recommendations

The results of this study support the findings of Alexander and McEwin (1989) that the number of career-oriented programs has increased at the middle-grade level in recent years. A continued increase in the number of programs indicates the need for more practicing and future teachers in the program areas to be prepared to teach at the middle-grade level.

The likely continued increase in the number of career-oriented programs at the middle-grade level dictates that appropriate curriculum materials and student activities be developed based on the needs and characteristics of early adolescents. Educators at the state and local levels who have responsibilities within career-oriented program areas should ensure that the programs address the educational, personal, and social developmental needs of early adolescents identified in the literature (Kindred et al., 1976; Curtiss & Bidwell, 1977; Greenberg & Hunter, 1982; Lipsitz, 1984).

Vocational teacher educators should be knowledgeable of practices and philosophies that guide early adolescent education and incorporate related instruction into existing courses. Teacher educators, state supervisors, and other individuals having responsibilities for professional development activities should

Table 2

Director Perceptions Regarding Aspects of Career-oriented Education in the Middle Grades (N=42)

Statement	Mean	Std. Dev.
Career-oriented courses can help middle-grade students understand the world of work.	5.31	1.15
Career-oriented courses can help middle-grade students develop their personal values.	5.03	.93
Career-oriented courses can contribute to the intellectual development of middle-grade students.	5.00	1.12
Career-oriented courses can contribute to the social development of middle-grade students.	5.00	.95
Career-oriented courses can contribute to the vocational development of middle-grade students.	4.95	1.12
The concepts of career-oriented education should be incorporated into middle-grade core courses.	4.74	1.25
The concepts of career-oriented education should be taught in career-oriented courses.	4.41	1.42
Team competition should be an important part of middle-grade vocational student organizations.	4.05	1.54
Individual competition should be an important part of middle-grade vocational student organizations.	2.90	1.50

Scale:
1=strongly disagree; 2=disagree; 3=somewhat disagree; 4=somewhat agree; 5=agree; 6=strongly agree

provide in-service programs related to early adolescent education to practicing middle-grade teachers and to those who may assume the role of teaching at that level. Through in-service and supervisory activities, state supervisors should ensure that middle-grade programs are effectively meeting the needs of early adolescents and are congruent with goals and philosophies of middle-grade education.

Based on the responses of the directors, career-oriented education can help meet many of the educational and developmental needs of early adolescents that have been described in the literature (Kindred et al., 1976; Curtiss & Bidwell, 1977; Sale, 1979; Greenberg & Hunter, 1982; Lipsitz, 1984; Carnegie Council on Adolescent Development, 1989). Beliefs expressed by the directors regarding the roles of career-oriented programs and VSOs are State generally in agreement with the philosophy expressed in the literature on middle-grade education as it pertains to career-oriented programs. However, the view expressed by many directors that the roles should include guiding into a particular high school curriculum is not supported in the literature and has been criticized as a goal of middle-grade education. Career-oriented programs should be supported for the benefits provided early adolescents, not for the potential the programs have for recruiting students into vocational education at the high school level.

Congruent with recommendations of the Secretary's Commission on Achieving Necessary Skills (1991), directors support incorporating career-oriented concepts into middle-grade core courses. Support for incorporating the concepts into core courses and for teaching the concepts in specific courses indicate a need for curriculum materials that can be utilized by core teachers and for materials specific to career-oriented courses.

Views expressed by the directors and in related literature (Brazee & Smalley, 1982; Rossetti et al., 1992) regarding competitive activities at the middle-grade level should guide educators and student organization leaders as they plan programs for early adolescents. Based on the literature and opinions of the respondents, competition should not be a primary focus of middle-grade VSOs. However, competitive activities that are part of the organizations should primarily involve team activities with opportunities for as many students as possible to participate. If competition is included in middle-grade VSOs, state supervisors and leaders of student organizations should develop activities and reward systems that are appropriate for early adolescents.

The support of state vocational education agency personnel for middle-grade career-oriented programs bodes well for the future of the programs. Educators should use the information provided by this study as evidence of support for the programs at the state level and as a means of securing support at the local level.

Because career-oriented education at the middle-grade level is a relatively new concept, much research and philosophical thought are needed to guide the development of programs. Educators need sound information on which to make decisions regarding middle-grade educational practices. Continued research efforts in this area are essential to providing career-oriented programs that effectively meet the needs of early adolescents.

References

Alexander, W.M., & McEwin, C.K. (1989). Schools in the middle: Status and progress. Columbus: National Middle School Association.

Beane, J.A. (1990). A middle school curriculum: From rhetoric to reality. Columbus: National Middle School Association.

Boyle, P.G. (1981). Planning better programs. New York: McGraw-Hill.

Brazee, E., & Smalley, B. (1982). What are middle schools good for? Instructor, 92(4), 31-33.

Carnegie Council on Adolescent Development. (1989). Turning points: Preparing American youth for the 21st century. New York: Carnegie Corporation.

Curtiss, T.E., & Bidwell, W.W. (1989). Curriculum and instruction for emerging adolescents. Reading, MA: Addison-Wesley Publishing Co.

George, P.S. (1988). Education 2000: Which way the middle school? The Clearing House, 62(1), 14-17.

Greenberg, A., & Hunter, A. (1982). Striving for excellence: Middle schoolers study work. Washington, D.C.: National Institute of Education. (ERIC Document Reproduction Service No. 236436)

Harrington-Lueker, D. (1990). Middle school reality falls short of the ideal. The American School Board Journal, 177(9), 27.

Kindred, L.W.; Wolotkiewicz, R.J.; Mickelson, J.M.; Copenlin, L.E.; & Dyson, E. (1976). The middle school curriculum: A practitioner's handbook. Boston: Allyn and Bacon, Inc.

Miller, M.J. (1988). Career counseling for the middle grade youngster: Grades 6-9. Journal of Employment Counseling, 25(4), 172-179.

Rossetti, R.; Padilla, D.; & McCaslin, N.L. (1992). A nationwide examination of middle school enrollment in agricultural education and membership in the National FFA Organization. Columbus: The Ohio State University, Department of Agricultural Education.

Sale, L.L. (1979). Introduction to middle school teaching. Columbus: Charles E. Merrill Publishing Co.

Secretary's Commission on Achieving Necessary Skills. (1991). What work requires of schools: A SCANS report for America 2000. Washington, D.C.: United States Department of Labor.

Complying with Perkins: Using Existing Tests to Measure Academic Gain for Vocational Education Students

Betty A. Bergstrom
Richard C. Gershon

Computer Adaptive Technologies, Inc.

Paper presented at the annual meeting
of the American Education Research Association

April, 1993
Atlanta, Georgia

Abstract

Perkins II requires State Departments of Education to develop accountability systems that document the progress of vocational education students. This paper discusses the possible ramifications of using existing tests to meet these requirements. Item calibrations obtained from a sample of vocational education students and a sample of students drawn from the general population are compared to determine whether test items function differentially for the two groups of students. While 4 items were significantly easier for vocational education students and 6 items were significantly more difficult, the correlation for the two sets of calibrations was .97. There was no difference in the rank ordering of students based on the source of the item calibrations.

Complying with Perkins: Using Existing Tests to Measure Academic Gain for Vocational Education Students

The Carl D. Perkins Vocational and Applied Technology Act Amendment of 1990 requires State Departments of Education to develop accountability systems that document the progress of vocational education students (Merkel-Keller, 1992). In order to meet these federal requirements, the State of Michigan is considering using an existing criterion referenced test, the Michigan Educational Assessment Program (MEAP), to assess progress in essential skills for vocational education students. The MEAP was designed to measure the attainment of essential skills in mathematics, reading and science with a goal of improving instruction in the state (Michigan Department of Education, 1990).

In the Spring of 1992, a pilot project was undertaken in which a sample of vocational education students took sections of the MEAP (Gershon and Bergstrom, 1992). The goal of the project was to explore the possibility of using the 10th grade MEAP as a pre-test, and then using a later version as a post-test to compute a measure of gain. It would be advantageous to use an existing test because of the time and cost involved in additional testing.

In this paper, we compare item calibrations obtained from a sample of students enrolled in vocational education programs and a sample of students drawn from the general population to determine whether items on the *Conceptualization and Problem Solving* section of the Essential Skills Mathematics Test of the MEAP function differentially for the two groups of students. We also compare the performance of vocational education students with the performance of students from the general population.

We discuss the implications for using existing tests to measure vocational student gain if test items are found to function differentially. Lastly, we suggest an alternative method of testing, appropriate for measuring gain.

Method and Results

Samples

In the Fall semester, mathematics and reading sections of the MEAP are administered to all 10th grade students in the state of Michigan. An official random sample of 2,040 students drawn from the 1991 test administration of the MEAP Essential Skills Mathematics Test was used for this study.

Five Intermediate School Districts (ISD) from throughout Michigan participated in a research project to administer sections of the MEAP to 11th and 12th grade students in vocational education programs. The tests were administered, by school personnel at the ISD vocational education centers, to 619 students in the Spring of 1992.

Test Specifications and Administration

A 50 item subsection of the *Conceptualization and Problem Solving* section of the Essential Skills Mathematics Test was used for this study. The content objectives covered in this section of the test included: 1) whole numbers and numeration, 2) fractions, decimals, ratio and percent, 3) measurement, 4) geometry, and 5) problem solving and logical reasoning. The mathematical processes required to answer these items included: 1) conceptualization and 2) applications and problem solving (Michigan Department of Education, 1990).

Comparison of Item Calibrations

We analyzed the data using the Rasch model program BIGSTEPS (Wright and Linacre, 1991). Separate item calibrations were obtained from the general population sample and the vocational education sample. The separate calibration t-test approach (Wright and Stone, 1979; Smith, 1992) was used to detect differences in calibrated difficulty of items between the two sets of calibrations. This approach uses the following formula:

$$t_i = \frac{d_{i1} - d_{i2}}{\sqrt{s_{i1}^2 + s_{i2}^2}}$$

where d_{i1} is the difficulty of item i in the calibration based on the general population sample, d_{i2} is the difficulty of item i in the calibration based of the vocational education sample, s_{i1} is the standard error of estimate for d_{i1} and s_{i2} is the standard error of estimate for d_{i2}. If items are functioning in a similar fashion for both samples, the estimates of their difficulties should be statistically equivalent and the value for t within the range $-1.96 < t < 1.96$ This method defines differential item functioning (DIF) as a statistically significant difference in the calibrated difficulty of the item for the two samples. For further details on the technical issues of this analysis, see Bergstrom, Gershon and Brown (1993).

In Figure 1, a comparison of the logit difficulties for the two sets of item calibrations shows that 6 items were significantly harder for the vocational education students (t value <-1.96), while 4 items were significantly easier for the vocational education students (t value >1.96). Given a normal distribution, we would have expected only 2 to 3 items to differ significantly.

When we examined the items which were functioning differentially, we found that, to some extent, the items which required abstract reasoning were more difficult for the

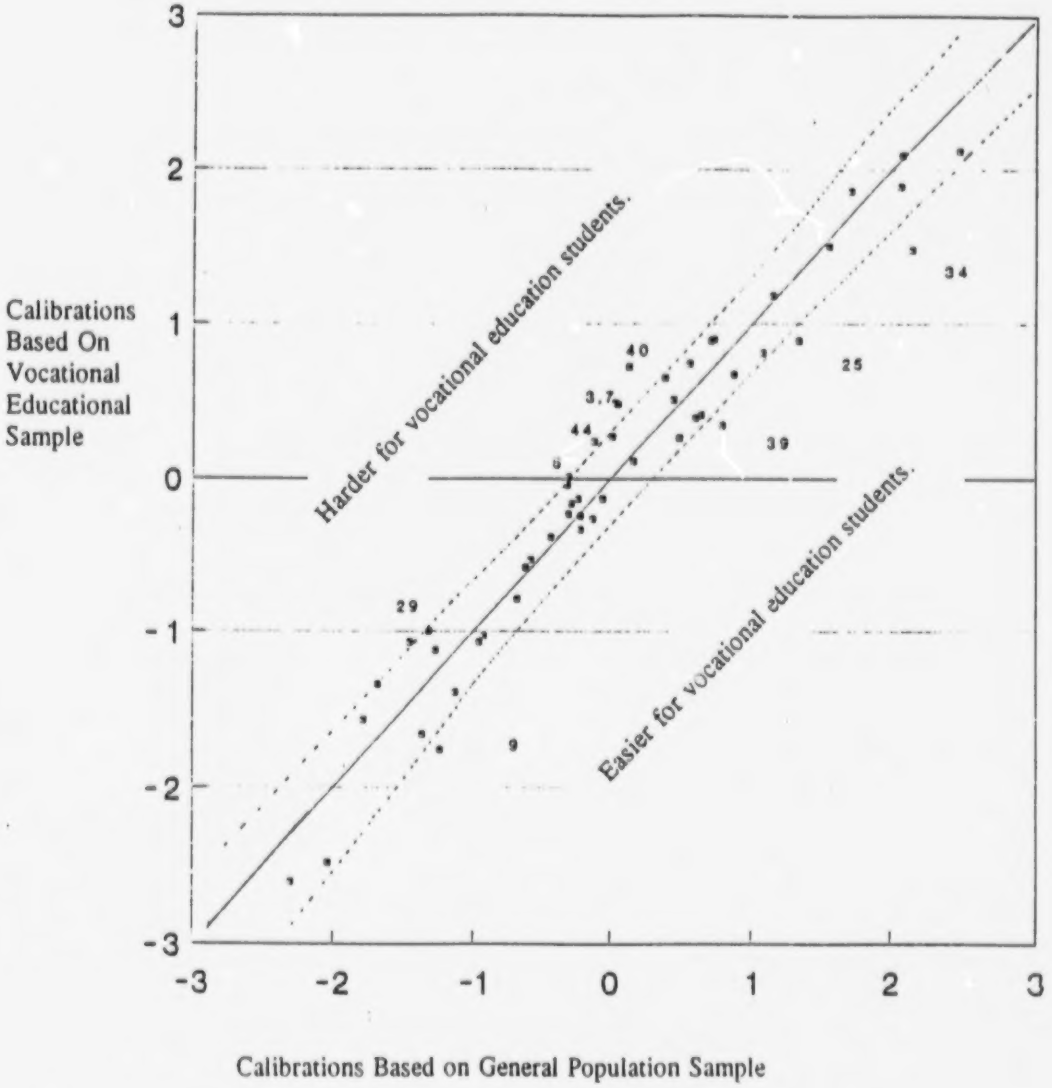


Figure 1. Comparison of item calibrations

THIS ITEM TYPE WAS EASIER FOR VOCATIONAL EDUCATION STUDENTS

Four companies submitted bids for building a pier. Based on the cost per foot, which company's bid was the HIGHEST?

COMPANY	COST	LENGTH
A	\$ 260.00	10 ft
B	\$ 300.00	12 ft
C	\$ 455.00	13 ft
D	\$ 170.00	20 ft

THIS ITEM TYPE WAS HARDER FOR VOCATIONAL EDUCATION STUDENTS

Which is the prime factorization of 81?

A $9 \cdot 9$
B 3^3
C 3^4
D $3 \cdot 27$

Figure 2. Examples of item types which functioned differently for vocational education students (actual MEAP items are not shown).

vocational education students while items which had concrete examples and/or required visual-spatial logic were easier for vocational education students. Figure 2 shows examples of the types of items (actual MEAP items are not shown) that were easier or harder for vocational education students.

Despite the fact that 10 items appeared as significantly harder or easier for vocational education students, the correlation for the two sets of calibrations was .94. This means that both the vocational education students and general education students ordered the items from easy to hard in a similar fashion.

Effect of Differential Item Functioning on Student Ability Estimates

TABLE 1

DESCRIPTIVE STATISTICS

	N	Mean	Standard Deviation
Persons			
General Sample	2040	-.19[1]	.89
Vocational Sample	619	-.44	.90
Vocational Sample[2]	619	-.46	.84

[1] logits

[2] Estimates obtained when all items are anchored to calibrations obtained from the general population sample.

Table 1 shows the descriptives statistics for student ability estimates. Vocational education students did not perform as well as the general population sample even though the vocational education students took the test in the Spring of 11th and 12th grade, while the general population sample was obtained from students in the Fall of 10th grade.

In order to examine the effect of differential item functioning on student ability estimates, we reanalyzed the vocational eduction data, anchoring all item difficulties on the calibrations obtained from the general population sample. We then compared the ability estimates obtained for the vocational students from the anchored and unanchored analyses. The effect of differential item functioning on student ability estimates for the vocational education students was negligible. The mean difference between the ability estimates obtained using item calibrations obtained from the vocational education sample and ability measures obtained from item calibrations anchored to the general population calibration values was -.02 with a standard deviation of .04. The correlation for the two sets of vocational student ability estimates was 1.00 indicating no difference in the rank ordering of students based on the source of the item calibrations.

Discussion

Using Existing Tests to Measure Gain

Although some items were shown to function differentially for the vocational education students, the estimates of their ability were not affected by the DIF. In this case, since 6 items were harder and 4 items were easier the net effect was that both sets of item calibrations estimated examinee ability comparably. This study however, points out the importance of examining differential item functioning before a test is used to measure gain over time.

The possibility exists for interaction between gain and item type, if items have been shown to function differentially for the subpopulation for which the gain score is being computed, and the proportion of item types in the test changes from test form to test form. For example, if the post test contains 15% more items based on concrete examples than the pre-test, and students appear to have improved over time, is the improvement due to actual gain, or is the improvement due to an increased percentage of items which these students find easier? The reverse scenario is also possible, in which, due to the proportion of item types presented, students do not show gain.

The MEAP is a criterion referenced test. Each year a new version of the test is created and equated to a 1991 benchmark test and each new test contains items which map to the criterion reference objectives. Since items are mapped to specific objectives, in this case, it is unlikely that the proportion of item types will vary greatly from year to year. Studies should be done to determine if this is actually the case.

Importance of Comparing "Like" Samples

If a comparison of gain scores between the performance of vocational education students and students in the general population is to be made, independent variables need to be considered. Teachers who participated in the study felt very strongly that the proportion of special education students in each population should be taken into account. One reasonable method for comparing gain scores would be to block on the pre-test score and compare gain within blocks. This would solve the problem of comparing two populations with unequal proportions of special education students. Gain for less able students may be greater than gain for high able students. Also, the grade level that the student entered vocation education should be included in the analysis.

Using Computer Adaptive Tests to Measure Gain

Vocational education students are a diverse group. The programs offered in vocational education range from agriculture to cosmetology to business to auto body repair. If the pre-test, post-test instrument is too difficult or too easy for the student, gain will not be measurable. One alternative to using a single pre-test/post test instrument is to use computerized adaptive testing. In this case, rather than the 10th grade essential skills mathematics test, the entire 10th grade item bank and possibly even lower grade level item banks could be used for pre and post tests. With an adaptive test, each student would be measured at his current ability level in both the pre and post test administration. The adaptive algorithm could ensure that the proportion of item types presented to each students remained constant.

Conclusion

Everyone wants to avoid repetitious or unnecessary testing and so exploring the use of an existing instrument to meet the Perkins II requirements is a sensible procedure. However, studies to determine item types contained in the test, possible differential item functioning across item types, and the stability of the proportion of item types across test forms should be undertaken before an instrument designed for one purpose is used to measure gain.

References

Bergstrom, B.A., Gershon, R.C. and Brown, W.L. (1993, April) *Differential item functioning vs differential test functioning*. Paper presented at the annual meeting of the American Education Research Association, Atlanta, GA.

Gershon, R.C. and Bergstrom (1992) *Final report: Standard 1 pilot project*. Lansing. MI: Department of Education.

Merkel-Keller, C. (1992, April) *Hands on assessment: Beyond the pencil and paper in vocational education.* Paper presented at the annual meeting of the American Education Research Association, San Francisco, CA.

Michigan Department of Education (1990, September) *Michigan Educational Assessment Handbook.*

Smith, R.M. (In Press) *Applications of Rasch Measurement* Chicago: MESA Press.

Wright, B.D. and Linacre, J.M. (1991) *BIGSTEPS* (Computer Program) Chicago, Il: MESA Press.

Wright, B.D. and Stone, M.H. (1979) *Best test design.* Chicago: MESA Press.

TEACHERS' ROLES IN INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION: A CONCEPTUAL FRAMEWORK

Curtis R. Finch
B. June Schmidt
Susan L. Faulkner

Virginia Tech Office
National Center for Research in Vocational Education
Division of Vocational and Technical Education
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061-0254

The research reported herein was performed for the National Center for Research in Vocational Education, University of California, Berkeley, pursuant to a grant from the Office of Vocational and Adult Education, U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

Paper presented at the
American Education Research Association Meeting
Atlanta, Georgia
April, 1993

TEACHERS' ROLES IN INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION: A CONCEPTUAL FRAMEWORK

Curtis R. Finch, B. June Schmidt, & Susan L. Faulkner

OVERVIEW

Despite the legislative mandate for and current emphasis on integrating academic and vocational education, specific roles that teachers play in the achievement of integration have received little attention. In fact, persons initiating integration programs across the country have had little time to consider the factors associated with this process. Numerous factors influence the educational environment and instructional methods favored by a teacher (Jansen & Oltjenbruns, 1990). However, traditional approaches that teachers perceive as most readily available and most effective tend to be the most likely to be used by them. Simply advising, or even legislating, that teachers must integrate academic and vocational instruction will not achieve the desired effect. Rather, it is first important to understand the contexts within which academic and vocational education integration takes place and, building upon these contexts, determine administrators', counselors', and academic and vocational teachers' roles in this complex process. Our research, which is one of several National Center for Research in Vocational Education (NCRVE) studies focusing on integration, addressed directly the above need by examining the roles teachers assume as they integrate academic and vocational education. More specifically, we examined the roles academic and vocational teachers play in the integration of academic and vocational education and, based on this examination, created a conceptual framework that describes educators' collaborative roles in the integration process.

INTEGRATION: FROM IDEA TO REALITY

As early as 1983, A Nation At Risk (National Commission on Excellence in Education, 1983) called for educational reform through decreasing the cafeteria-style curriculum and increasing time spent learning English, mathematics, science, social studies, and computer science. At about the same time, the authors of The Unfinished Agenda (National Commission on Secondary Vocational Education, 1984) believed that education should prepare all young people for adult life. The report authors suggested accomplishing this task through a "joint effort of academic and vocational educators to 'bridge the gap' between theoretical and practical education" (Adelman, 1989, pp. 1-2).

More recently, the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 addressed the importance of integrating academic and vocational education to make the United States a more competitive nation. Under Section 2 of the Act it is written that "It is the purpose of this Act to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population." Further, Benson (1989) has cited the findings of cognitive scientists to support the integration of academic and vocational education. Researchers have found that students are better able to transfer problem-solving skills to the workplace when theory is taught in a practical context.

Integration of academic and vocational education has great potential to achieve the above aims but only if and when professionals recognize and understand that teachers' roles as well as the roles of others must change. As Schmidt (1991) has indicated, academic and vocational teachers need to function as contributing members of a professional team that focuses on teaching students rather than operating as independent agents who focus solely on their own teaching content.

THE FIELD STUDY

Gathering information about the contexts within which integration occurs and interactions among professionals necessitated the use of qualitative research techniques. Initially, a national search was conducted to identify public secondary schools that were actively and successfully integrating academic and vocational education. Nominations were sought from the 50 states and from several nationally recognized leaders in the integration movement. From the schools nominated, 10 secondary school sites including magnet schools, academies, comprehensive high schools, and technical centers located in 10 different states were ultimately selected to participate in the study. Further details about the selection process are provided in the report titled Teachers' Roles in the Integration of Vocational and Academic Education (Schmidt, Finch, & Faulkner, 1992).

A face-to-face interview, supplemented by researchers' observations of activities in the school, was used as primary means of obtaining field data. A three-part semi-structured interview schedule was developed to interview principals, nonprincipal administrators, counselors, and academic and vocational teachers in the participating schools. A key element of the interview schedule was the Behavioral Event Interview (BEI). Developed by McClelland (1978), the BEI is based on the Critical Incident Technique created by Flanagan (1954). The BEI is designed so that a particular event can be explored until behaviors, thoughts, and feelings are adequately described (McClelland, 1978). The BEI has had a successful history of use in a variety of settings, including business, industry, education, and the military (Spencer, 1979; Goleman, 1981; Huff, Lake, & Schaalman, 1982; Finch, Gregson, & Faulkner, 1991).

During each interview, the interviewee was first asked to recall a specific situation. This was a situation or a specific time when the interviewee and others (both academic and vocational teachers) were particularly effective at integrating academic and vocational education. The interviewee was asked to give attention to the roles of both academic and vocational teachers in this situation. Next, the interviewee was asked to recall another situation when he or she and others (both academic and vocational teachers) would, due to hindsight, change what had been done. In other words, this is a situation where the integration of academic and vocational education could have been improved. Again, the interviewee was asked to recall the roles of both academic and vocational teachers in this situation.

A total of 109 interviews were conducted at the 10 school sites. Based upon a preliminary examination of events, 197 of the 218 events were classified as useable and 21 were either unuseable or not fully developed events. The interview process generated several thousand pages of interview notes, event write-ups, and coded information. To avoid a data overload, we utilized a comprehensive analysis system in the form of a computer software program titled The Ethnograph. This software enabled researchers to code, group, recode, and regroup information according to established and emerging themes.

TEACHERS' ROLES: THEMES

Based on the initial review of write-ups from one site and building upon the categories identified by Schmidt (1991), several themes emerged. As coding continued, the number of themes grew until six could be identified. The six themes included Cooperative Efforts, Curriculum Strategies, Instructional Strategies, Administrative Practices and Procedures, Student Outcomes, and Teacher Outcomes.

Cooperative Efforts were described as collaboration between academic and vocational teachers related to the integration of academic and vocational education that does not specifically focus on curriculum development or instructional design and delivery. Included in this theme were statements such as sharing student information and completed assignments from students; sharing competency lists, books, materials, and equipment; working together to focus on students' needs; observing other teachers' classes; and providing other teachers with general suggestions for change.

Curriculum Strategies were described as vocational teacher or academic and vocational teacher involvement in curriculum building that focuses on integrating academic and vocational integration curriculum content, organization, and sequence. Organized around this theme were statements such as restructuring academic courses to be more applied, restructuring vocational courses so they include more academic content, designing student projects that cut across academic and vocational education classes, participating in joint curriculum planning meetings, imbedding academic/vocational content in academic/vocational courses, and building more content from an employer and employment base.

Instructional Strategies were described as vocational teacher or academic and vocational teacher involvement in actual instruction that integrates academic and vocational education. Included in this theme were statements such as incorporating academic/vocational skills into day-to-day instruction, using academic and vocational teams to teach classes, employing class projects and assignments that are jointly sponsored by academic and vocational teachers, and illustrating applications via equipment and supplies from other (academic/vocational) teachers' area.

The **Administrative Practices and Procedures** theme focused on activities typically performed by administrators that enhance the integration of academic and vocational education. These activities should have some impact on vocational teachers and teaching. Included in this theme were statements such as organizing academic and vocational teachers into collaborative curriculum and instructional teams, planning professional development activities for teachers, resolving integration disputes among teachers, monitoring integration activities, making necessary adjustments, and evaluating the success of integration activities.

Student Outcomes were described as student change resulting from the integration of academic and vocational education process. This was typically a testimonial about how instruction helped a student or students in some way. Included in this theme were statements such as getting a job interview, feeling more competent or proficient, being able to perform a task, staying in school, and getting better grades/being a better student.

Teacher Outcomes were described as teacher change resulting from the integration process. This is typically a testimonial about how the integration of academic and vocational education helped "me" or "us" to become a more effective teacher(s). Coding was done for both academic and vocational teachers. Included in this category were statements such as teaching more relevant content, getting along better with academic/vocational teachers, and understanding more about an academic/vocational area.

TEACHERS' ROLES: STAGES AND SUBTHEMES

Detailed analysis of the six themes resulted in the identification of many meaningful stages and subthemes. Collectively, they contributed to the already rich theme descriptions. The stages and subthemes also helped clarify ways that the six themes linked with each other. Stages and subthemes associated with each of the six themes are described below.

Cooperative Efforts Stages

The first Cooperative Efforts stage could be termed **Knowing**. For any integration activity to occur, it was first important for academic and vocational teachers to learn about one another. This knowledge enabled them to offer help as well as ask for help from one another.

Stage two reflects **Helping and Sharing**. From initial offers of help and seeking help, more formal settings emerged where teachers became involved in instructing one another. Instruction in the schools we visited focused on teachers teaching one another about basic academic skills--as used in vocational settings and as taught in academic settings. This in turn evolved into teachers planning together, sharing information about instruction provided in their classes, and sharing information about students they both had in their classes.

During the third stage of Cooperative Efforts, which was called **Coordinating**, teachers assisted one another with instruction, carefully dovetailing their instruction and coordinating the scheduling of instruction. Academic and vocational teachers approached the instruction of academic skills in the same way and were careful not to give contradictory information on assignments. Further, the academic teachers willingly rescheduled instructional sequences in their classes to reinforce what students were learning in vocational classes and vice versa.

Curriculum Strategies Stages

The first Curriculum Strategies stage was titled **Meeting and Planning**. In this stage, teachers worked together, often meeting over extensive periods of time to plan coordinated assignments, projects, and instructional sequences. At this stage in the integration process, academic and vocational teachers noted the importance of aligning their curricula.

Termed **Changing**, the second stage of Curriculum Strategies involved teachers shifting from past patterns, particularly when these patterns had led to instruction that was out of step with the needs of today's students. Both program offerings and in-class instruction were changed as a result of the teachers' integration efforts.

During the third stage, which was labeled **Designing and Enhancing,** teachers undertook the design and preparation of elaborate, over-time projects involving coordinated and collaborative instruction. Further, the teachers moved to enhancing these projects through input and participation from persons in the business community.

Instructional Strategies Stages

The first Instructional Strategies stage, which was titled **Initiating Integrated Instruction,** focused on the day-to-day instructional routine of classes, in which teachers found instances where they could readily integrate academic and vocational content. Teachers were particularly enthusiastic about instances where the integrated efforts led them to focus on applications of academic skills. The teachers also learned that students could initiate instances where academic and vocational content were integrated.

During the second stage, which was called **Teaching Cooperatively,** teachers taught cooperatively through such ways as joint assignments, conducting joint grading of assignments, teaching common content at the same time in their classes, and using common teaching strategies. Further, some of the academic and vocational teachers began team teaching and thus were able to reinforce one another's instruction in the same classroom setting.

In the third stage, titled **Using Resources,** teachers found that their advanced integration efforts could be enhanced by using people and resources from the community.

Administrative Practices and Procedures Stages

Termed **Facilitating,** the first stage of Administrative Practices and Procedures reflected the initial strategy that administrators pursued when implementing the integration process. Administrators at sites we visited provided team building and support activities that gave teachers a feeling of comfort with the substantial changes they were undertaking. Additionally, administrators openly addressed teachers' concerns about integration.

The second phase, which was called **Communicating and Assisting,** was when administrators moved to help teachers understand administrative constraints that existed to gain teacher support for working within those constraints. Further, administrators found that they learned from experience, noting that they initially made mistakes which they later overcame. Providing and maintaining adequate and open communication was one area, in particular, where administrators noted that they learned from experience. Another area where administrators proved effective in facilitating the integration process was scheduling and class organization. Open communications with teachers helped the administrators identify and resolve scheduling problems.

Supporting, which constituted the third phase, centered around the teachers feeling confident of administrative support and feeling that they were involved in the integration process. Failure to meet these two expectations for all teachers on an on-going basis quickly led to resentment toward change during the integration process. Thus, administrators were not only actively involved in the initial aspects of integration but also throughout the entire process.

Teacher Outcomes Subthemes

The Teacher Outcomes theme was further deliniated into subthemes but not stages. These subthemes reflected growth, satisfaction, and/or recognition teachers achieved as a result of being involved in the integration process. The six subthemes included **Recognizing the Value of Integration, Collaborating with Other Teachers, Growing Through Professional Development, Teaming with Others to Teach, Approaching Teaching in New Ways, and Becoming a More Integrated Teacher**. The teachers we interviewed provided numerous examples of the ways integration had been beneficial to them that aligned with these six subthemes.

Student Outcomes Subthemes

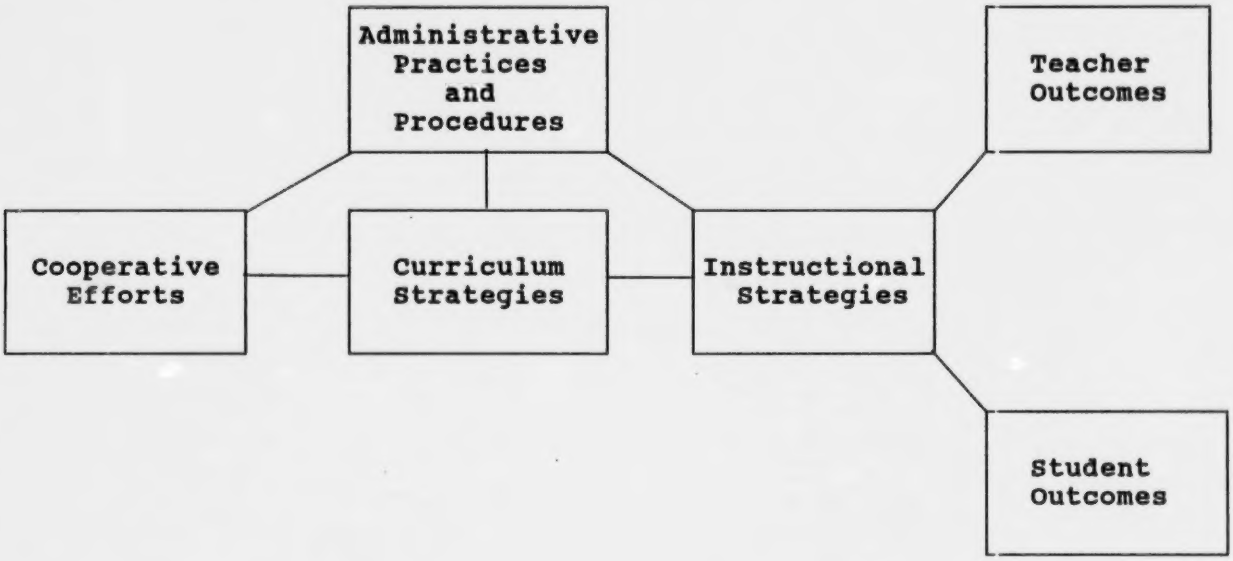
The Student Outcomes theme focused on the link between the integration process and student improvement and/or success. This was typically a testimonial from an administrator, counselor, or teacher about how integrated instruction helped a student or students in some way. The subthemes that emerged through analysis of the Student Outcomes theme included **Performing a Task Better, Transferring Learning, Making Better Grades/Passing a Class/Staying in School, Approaching Learning Through Application, Becoming More Competent or Proficient, and Accepting Academic/Vocational Programs**. Persons we interviewed provided testimony about the ways that integration had positive impact on students in their schools.

TEACHERS' ROLES: A CONCEPTUAL FRAMEWORK

Emerging from the various integration themes and subthemes was a more comprehensive view of teachers' roles in the integration process. This view, which is provided as Figure 1, displays the six themes and the ways they appear to link together. The subthemes described earlier serve to further clarify relationships that exist across the six themes.

Cooperative Efforts, Curriculum Strategies, and Instructional Strategies may be considered as cumulative, with each aspect of the integration process contributing to the next. Cooperative Efforts, which includes knowing, helping and sharing, and coordinating, provides a foundation for the initiation of Curriculum Strategies (meeting and planning, changing, and designing and enhancing). These two themes, likewise, contribute to the initiation of Instructional Strategies (initiating integrated instruction, teaching cooperatively, and using resources). Administrative Practices and Procedures contribute directly to the success of Cooperative Efforts, Curriculum Strategies, and Instructional Strategies through facilitating, communicating and assisting, and supporting activities provided by administrators. Collectively, the four themes

FIGURE 1. A FRAMEWORK FOR TEACHERS' ROLES IN INTEGRATION


Administrative Practices and Procedures
Teacher Outcomes
Cooperative Efforts
Curriculum Strategies
Instructional Strategies
Student Outcomes

contribute to Teacher Outcomes and Student Outcomes. These outcomes constitute the desired changes that should ultimately occur in schools where academic and vocational education are integrated.

DISCUSSION

Although not fully explicated, the framework for teachers' roles in the integration process should be of much value to both researchers and practitioners. For researchers, the framework may serve as a starting point for studies that seek to link the integration process and teacher and student outcomes. For example, a study focusing on integration curriculum strategies should take into account the ways that teachers' cooperative efforts and instructional strategies and administrative practices and procedures impact on curriculum strategies. Such a study should, likewise, consider the impact of curriculum strategies in terms of both teacher and student outcomes. The framework may thus serve as a starting point for integration research that is more holistic rather than isolated and piecemeal.

In terms of benefits to practitioners, the framework can provide a useful means of describing the integration process and teachers' roles in that process. It can demonstrate to professional educators how integration is a dynamic process that requires a great deal of collaboration and teamwork. And finally, the framework can be used to emphasize that integration is more than a process. Ultimately, successful integration should contribute to positive, long term gains for both teachers and students. This is perhaps the most significant contribution that integration can make to education. However, for this to occur, educators must recognize that integration focuses on outcomes as well as process.

REFERENCES

Adelman, N. E. (1989). The case for integrating academic and vocational education. Washington, DC: Policy Studies, Inc.

Benson, C. (1989, July 27). On integrating academic and vocational education. Testimony before the Senate Subcommittee on Education, Arts, and Humanities.

Finch, C. R., Gregson, J. A., & Faulkner, S. L. (1991). Leadership behaviors of successful vocational education administrators. Berkeley, CA: National Center for Research in Vocational Education, University of California.

Flanagan, J. C. (1954). The critical incident technique. Psychological Bulletin, 51(4), 327-358.

Huff, S., Lake, D., & Schaalman, M. L. (1982). Principal differences: Excellence in school leadership and management. Boston, MA: McBer.

Goleman, D. (1981, January). The new competency tests: Matching the right people to the right jobs. Psychology Today, 15(1), 35-46.

Jansen, D., & Oltjenbruns, K. (1990). Education and schooling issues. In (N. Frantz & M. Miller, Eds.). A context for change: Vocational-technical education and the future. Macomb, IL: Curriculum Publications Clearinghouse, University Council for Vocational Education.

McClelland, D. C. (1978). Guide to behavioral event interviewing. Boston, MA: McBer.

Mentkowski, M., O'Brien, K., McEachern, W., & Fowler, D. (1982). Developing a professional competence model for management education. Milwaukee, WI: (Alverno College Productions).

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. (Publication No. 065-000-00177-2). Washington, DC: U.S. Government Printing Office.

National Commission on Secondary Vocational Education. (1984). The unfinished agenda. Columbus, OH: National Center for Research in Vocational Education.

Schmidt, B. J. (1991, July). What works in integrating academic and vocational education. Paper presented at the Southern Regional Education Board-Vocational Education Consortium Staff Development Conference, Saddlebrook Resort, FL.

Schmidt, B. J., Finch, C. R., & Faulkner, S. L. (1992). Teachers' roles in the integration of academic and vocational education. Berkeley, CA: National Center for Research in Vocational Education, University of California.

Spencer, L. M. (1979, August). Identifying, measuring, and training "soft skill" competencies which predict performance in professional, managerial, and human service jobs. Paper presented at the Soft Skill Analysis Symposium, Department of the Army Training Development Institute, Ft. Monroe, VA.

American Educational Research Association

1993 Annual Meeting

Vocational Education SIG

The Long-term Effects of Secondary and Post-Secondary Educational Attainment on Yearly Earnings: Is Gender an Issue?

Kenneth Gray
Penn State University
119 Rackley Building
University Park, PA 16802
814-863-2593

Haung, Neng-Tang
National Taiwan Normal University

The Long-term Effects of Secondary and Post-Secondary Educational Attainment on Yearly Earnings: Is Gender an Issue?

Kenneth Gray and Haung, Neng-Tang

Abstract

The purpose of this research was to test for possible gender differences in the effects of secondary and post-secondary educational attainment on yearly earnings. The data for the study (n = 5,357) were taken from the National Longitudinal Study, Class of 1972 (NLS-72). Ordinary least squares multiple regression analysis was employed. High school academic curriculum, vocational education curriculum, college, and graduate school were found to affect earnings significantly; the magnitude of these effects was greater for men than for women. The most influential variables affecting earnings were occupations and industrial sector of employment; importantly, the magnitude of these effects were greater for women than for men, magnifying the importance of providing women with equal access to all occupations and industries.

The Long-term Effects of Secondary and Post-Secondary Educational Attainmenton Yearly Earnings: Is Gender an Issue?

Does education positively affect earnings? Most believe that it does. According to conventional wisdom, the more education you get, the more you earn. In particular, it is generally believed that post-secondary education will pay off in higher yearly earnings while high school occupational preparation programs will not, and that these effects are the same for men and women.

College is viewed as the expressway, the only expressway, to the American economic dream. The degree to which this conventional wisdom has affected both secondary and post-secondary schools since the early 1980s cannot be overstated. In the nations high schools, enrollments in college preparatory programs are mushrooming while enrollments in vocational education programs are literally withering away: today, less than one out of every five high school graduates seeks full-time employment upon graduation while nationally, 62% of high school graduates go on to higher education, and while enrollment in vocational education has declined in 32 states (Gray, 1990). Colleges are turning out graduates with bachelors degrees in record numbers; in June of 1992, more individuals graduated with B.A. degrees than live in the state of New Hampshire. While this may seem a wonderful achievement, the glow diminishes a bit when one considers that the Department of Labor predicts a 400,000 job shortfall in college level employment at least through the year 2005 (see Hecker, 1992; Shelley, 1992); that the average college graduate amasses $9,800 in debt; that in many institutions (the exact percentage is a well-kept secret), over one-half of the entering freshman class is required to take one or more remedial courses; and that the Stafford student loan program default rate has increased 1,600% since 1980.

Things would seem to be a bit out of control. Literally everyone wants to go to college; even in rural Louisiana (Kotrlik and Harrison, 1989), over 90 percent of the parents of high school seniors wanted their children to go to college. Students and parents alone spent $80 billion on higher education in 1991-92, much of it borrowed; a family whose a income is at the median would have to give up 33% of their annual income to pay the average cost of education at a private college (Center for Education Statistics, 1992). Why do they do it? Because they have been led to believe that doing so will pay off. When polled, the single most common reason given by students and parents for paying for a college education is getting a better job. They, like just about everyone else, have mistaken correlation with effect.

The belief that higher education leads to higher earnings is largely the result of widely reported statistics that are organized to show that the average or median yearly earnings of college graduates are higher than those of high school graduates. The interpretation is then made that the effect is due to educational attainment (for a typical example, see Education Week, February, 1993). Such conclusions, however, are largely ex post facto and the analysis is correlation; thus, conclusions about cause and effect are inappropriate, a fact largely ignored by nearly everyone and one that the higher education community--the ultimate sacred cow--has done little to correct. To make a point, yearly earnings also are highly correlated with other variables such as socioeconomic status of parents. This fact alone could explain a large part of the higher earnings for college graduates. Specifically, while some children of the poor managed to go to college, just about all children of the rich go on to higher education; thus, in the pool of college graduates, the sons and daughters of the wealthy are overrepresented. The point is that the effect of higher education is probably being overestimated while the effects of high school occupational preparation are understated and the relative effects could differ by gender. This hypothesis prompted the researchers to conduct this study.

The purpose of this study was to expand our understanding of the effects of educational attainment on yearly earnings by examining the experiences of 1972 high school graduates 14 years after they completed high school. The analysis is unique in three ways. First, it went beyond testing the effect on income of simply graduating from high school to testing the effect of two specific high school programs of study (college preparatory and vocational education) as well as the interaction of these high school curriculum variables and participating in various types of post-secondary education (community college, technical school, college, and graduate school). Second, it used a data set (NLS-72) that allows the analyses of a mature set of individuals who were on average 32 years old at the time earnings data was collected. Finally, separate multi-variant equations were run for males and females, to investigate whether educational effect differed by gender.

Background

This research expanded on a previous study by the authors (Haung and Gray, 1992). The particular focus of the earlier study was possible positive effects on earnings for graduates of vocational education programs who then attended technical or community colleges. No such interaction effect was found. High school vocational education, a college degree, and a graduate school degree were the only "educational attainment" variables found to have a statistically significant effect on yearly earnings. Like other research of this type (see Campbell et al. 1987; Grasso and Shea, 1979; Kang and Bishop, 1986), the variable that was the strongest predictor of yearly earnings was gender--namely, being male had a largely positive effect on income. In light of this finding as well as national attention on higher education as a way to narrow the gender wage gap--actually, more women than men now attend and graduate from baccalaureate colleges--the question of possibly different educational effects for men and women and the direction and magnitude of these effects becomes important.

In the review of literature conducted prior to this study, surprisingly little "recent" research was found that examined the effects of higher education on earnings, particularly research that included high school educational variables. Most of the recent literature, particularly popular literature, has used correlational data to argue that or explain why college graduates as a group earn more (see Hecker, 1992). One noted and important exception is the work done by Grubb (1992) in investigating educational effects of two-year community college education. In this study, possible gender differences were investigated; it was found that "consistently, credentials from community colleges and technical institutes benefit women more than men," while a B. A. degree had a positive effect on both genders, though the return to males was higher than to females.

Likewise, little recent work was found regarding internal returns to investment for higher education. Cohen and Hughes (1991) did conclude that the internal return on investment (IROI) in higher education was sufficient to justify investing in higher education but did not calculate separate returns for males and females. The possible importance of gender is suggested by Butler's (1992) study of returning adult women; the conclusion was that the IROI would be negative for women over 35 years old.

One recent correlational study is important. Using IRS data from Ohio, Ghazalah (1991) found that average earnings of high school graduates who did not continue their education but did complete a vocational education program while in high school were higher than for high school graduates who did not take vocational education in high school and did not go on to higher education. This finding confirms the findings of the original study conducted by this research team--that high school vocational education had a significant positive effect on earnings.

Methodology

The data for this study were drawn from the data tapes of the National Longitudinal Study of the High School Class of 1972 (NLS-72) (Center for Educational Statistics, 1987). The NLS-72 data set was developed from a national probability sample of 19,001 high school seniors in the spring of 1972 (Riccobono et al., 1981). Those in the sample were surveyed again in 1973, 1974, 1976, 1979, and 1986. The purpose of the NLS-72 study and subsequent follow-up studies was to follow the educational and occupational experiences of young people in relation to high school program of study, family backgrounds, and other demographic variables. The most recent earnings data available was the 1986, fifth follow-up survey, making the average respondent 32 years old (Tourangeau, 1987). The sample for this study was restricted to individuals in the NLS-72 data set who had completed high school transcript data, post-secondary attainment data, and had labor force status in the civilian labor force at the time of the fifth NLS-72 follow-up survey in 1986 (n= 3,309).

The purpose of this research was to test for the effect on yearly earnings of various types of secondary and post-secondary education . In order to control for other confounding variables that influence yearly earnings, the effects were estimated through an equation that expressed the measures of labor market outcomes as a linear function of high school curriculum, post-secondary educational attainment, and an array of moderating variables including race, marital status, aptitude, family socioeconomic status, occupation, and industrial sector of employment. The matrix notation of the ordinary least squares multiple regression model used in the study was:

$$Y = a_o + b'_j T_j + q'_k X_k + U$$

where **Y** = the dependent variable (yearly earnings), **T** = a column vector of high school curriculum and educational attainment (dummy coded), **X** = a column vector of moderating variables, **U** = disturbance, with **E (To)** = 0, and **E (XU)** = **O**, where **O** is a column vector of zeros, **a** = a scalar constant parameter, **b'** = a column vector of constant parameters (prime denotes transpose), and **q'** = a column vector of constant parameters (prime denotes transpose). The model was run both for males and females to test for possible gender differences in educational effects.

A critical element in research designed to measure the effects of various high school curricula is valid identification of the high school program of study (academic, vocational, or general) actually completed by individuals in the sample. Three methods are typically used by researchers: credit counts, self-report, and encoding by professional school counselors after reviewing individual transcripts. The literature suggests that self-report data tends to inflate the number of those completing college preparatory programs and to undercount those completing vocational education programs.

Credit counts tend to overestimate the number of persons completing true vocational education programs as a result of liberal definitions of vocational education concentrators. For this reason, the counselor-coded data contained in the NLS-72 data base were used in this study.

The statistical procedures used in this study included frequency distributions, descriptive analysis, and ordinary least squares regression. The significance level was set at .10.

Sixty-six terms were built into the regression model. In the first stage of data analysis, the raw data for each dependent variable was regressed in the full model. In order to check the aptness of the model, the residuals and the fitted values of each regression were requested from the SAS REG procedure (SAS Institute Inc., 1985). A scatter plot of residual versus fitted values was examined for each regression. As a result of this analysis, a square-root transformation was performed that resulted in an observation focusing more on independent residuals versus fitted plot. This transformation was judged to be superior to the log adjusted transformation that resulted in a lower R-square. Therefore, the square-root transformed yearly earnings were used as the dependent variable in this study. To reduce the number of regressors used in the regression model and to obtain a more precise measurement, the SAS STEPWISE procedure was used to select the most appropriate model for each dependent variable. After each STEPWISE procedure, all of the significant terms were then used as the reduced model for further analysis.

Limitations of the Study

Several possible limitations to this study should be noted. The first limitation pertains to the sample. When the sample was limited by the selection criterion, only 3,909 of the 12,481 individuals completing the NLS-72 fifth year follow-up remained. In particular, it should be noted that persons not having an employment status were not included. Further, it must be reported that of the sample, 97% reported having had some post-secondary experience, defined liberally by NLS-72 as any course work beyond high school. While this percentage would seem high, it was consistent with the percentage reported by NLS-72 for the entire sample in 1986.

A second notable limitation pertains to the coding of post-secondary experience into the categories of vocational-technical, community college, college graduate, and graduate studies. The post-secondary experience designations used in this study were created by NLS-72 . All individuals who reported some higher education but did not complete a baccalaureate program or graduate studies were lumped together in either the vocational-technical or community college categories. Thus those coded as vocational-technical or community college may have completed anything from a single course to seven or more semesters of college work that did not culminate in a baccalaureate degree.

Findings

Results of the multiple regression analysis are presented in Table 1. which reports findings for males and females in the sample. While the researchers do not wish to imply that the analysis is perfect, the R-squares were considered to be within the acceptable range for data that is cross- sectional, longitudinal, and in some cases self-reported. The sample included 2,800 males and 2,657 females. The model was slightly more robust for males than females. Caution must be used in interpreting the data due to low numbers in some cells; an example is the number of women employed as laborers, a variable that had a relatively high parameter estimate but was non-significant. The results will be discussed in the following order: modifying variables, educational variables, occupational variables, and industry sector variables.

Three moderating variables remained in the reduced model for both genders: socio economic status (SES) of parents, marital status, and region of residence (race was not found to be significant when SES was added). Gender differences appear immediately. Having parents of upper SES had a significant positive effect on the earnings of males but not on females. Being married positively affected the earnings of males but negatively affected the earnings of females. Being divorced positively affected the earnings of males; the effect on women was non-significant although it is interesting to note that the coefficient was positive, not negative as might be expected. Finally, living in a rural area negatively affects earning, but more so for women than men.

Both the high school academic (college prep) and vocational education programs of study were found to have positive effects for both genders. While caution must be taken not to make too much of beta weights (see McNeil, 1990), the differences in weights for high school curricula between men and women are worth noting. In both cases the effect for males of both completing a vocational and an academic program were about doubles that for females. Taking increasing numbers of academic credits in high school was found to have a positive effect only for males.

A positive effect on earnings was found for college and graduate school. Of all education variables, graduate school had the largest effect on earnings. The magnitude (beta weights) of these effects was again greater for males than females. Community colleges and technical colleges were not found to have a statistically significant positive effect on earnings for either gender. It is also worth noting that the original model contained interaction variables that linked high school programs of study (vocational and academic) with higher education (technical school, community college, and college). None of these interaction variables were significant in this study; these results, however, must be interpreted with caution due to low cell size.

Confirming common sense, the big factors that affect earning are job and industry in which employed (see Bills, 1988). This was the case for men and women but was particularly important for women. The effect, for example, from holding a professional or managerial position is greater for women than for men. The exception is sales. Finding employment in certain industrial sectors likewise has more of an effect for women than men. Working in the construction industry, for example, has a much larger positive effect for women than men, as did working in the communications industry.

Conclusions

The purpose of this study was to test for possible gender differences in the effects of educational attainment on yearly earnings. Data were taken from the NLS-72 data tapes. Those in the sample were, on average, 32 years old in 1986 when the dependent variable, yearly earnings, was recorded. Square root-adjusted OLS multiple regression was employed.

The results provided a rather rich explanation for a rather complex social phenomenon, namely, why some people earn more than others. Beginning with educational attainment, both high school and baccalaureate-level post-secondary education were found to have a positive effect for both genders. The magnitude of the effects were higher for men than for women, although the overlapping confidence intervals for these parameters estimates, particularly for post-secondary education effects, suggest caution in making too much of these differences. Positive and statistically significant educational effects were found for both the high school academic (college preparatory) program as well as vocational education. Baccalaureate-level and graduate-level education also had significant positive effects, with graduate school being the most influential.

While again caution must be used in interpreting beta weights, it is interesting to note that other than graduate school, the parameter estimates for all other significant educational variables were just about identical. For example, for both males and females, the effect of a vocational education program in high school was, for all practical purposes, of the same magnitude as graduating from college. Of course this is not a great revelation when one compares the annual incomes of established electricians, etc., with public school teachers. This leads one to wonder about the IROI for all types of higher education except graduate school in comparison to high school vocational education, which is free. Considering that a student can easily spend $80,000 for a college degree at a private college and that the Department of Education is reportedly spending in excess of $2 billion a year on student loan bad debt expenses, the relative return on high school vocational education, which is free, becomes an important national policy issue. Additional research in this area is warranted.

Neither post-secondary technical education nor community college education were found to affect significantly earnings for either gender in this sample. These results are not inconsistent with those reported by Grubb (1992). Possible explanation for the difference is our inclusion of high school curriculum-type variables in this study, and Grubb's more precise measure of two-year education participation.

As is the practice, several moderating variables were included in the equation. Noticeable gender differences were noted. Some findings were expected, such as the effects of being married, which were positive for males and negative for females. The effect of SES parents was, however, not expected. Being from upper SES had a positive effect on the earnings of males but not on females, leading one to speculate that either the daughters of the rich are not in the labor force or that if they are, families, ties, and wealth are not as much help.

The final set of variables found to have a significant effect on earnings confirmed the obvious reality: what one earns is a function of their occupation and the sector of the economy in which they are employed. The magnitude of the effects from these variables was dramatically higher than that for education. This was found to be particularly the case for women. Why occupational and industry type is more important for women then men is beyond the methodology of this study, but one can speculate that because of the overall depressed wages of women in many industries, the advantage of obtaining employment in high-paying occupations and industries is greater for females.

To summarize: while most types of post-secondary education were found to affect income positively, with the exception of graduate school, the magnitude of these effects were about the same as graduating from a high school vocational education program, a sobering thought in light of the cost of going to college. Different effects were found for men and women, the most important being not education but occupation and industrial sector of employment. This would suggest that the important issue in ending wage differences between men and women is insuring that women have equal access to all occupations and industries.

References

Bills, D. B. (1988). Educational credentials and promotions: Does schooling do more than get you in the door? Sociology of Education 61(January): 52-60.

Butler, M. (1992). A cost benefit analysis of higher education for returning adult women. Unpublished honors thesis, Penn State University, 1992

Campbell, P., Elliot, J., Laughlin, S. E., Farkas, G., Hotchkiss, L., & Stromsdorfer, E. (1987). Dynamics of vocational education effects on labor market outcomes. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University (ERIC Document Reproduction Service No. ED 215 217)

Center for Educational Statistics. (1992). Condition of Education, Volume 2. pp. 23.

Center for Educational Statistics. (1987). The National Longitudinal Study of the High School Class of 1972 (NLS-72) Fifth Follow-Up (1986) Data File User's Manual. Washington, DC: Author.

Education Week. (1992, February). Education and income. Author: 3. pp.

Cohn, E. & Woodrow, H. (1991) A benefit-cost analysis of investment in college education in the United States: 1969-1985. Paper presented at the Annual Meeting of the Southern Economic Association, Nashville, TN, November 25.

Gray, K., and Huang, N. T. (1992). *An analysis of the long term effects of educational attainment on yearly earnings*. Journal of Industrial Teacher Education.

Gray, K. (1990). Roots of crisis: A study of declining secondary vocational education graduates in central Pennsylvania. Journal of Industrial Teacher Education, 28(1):17-29.

Hecker, D. E. (1992, July). Reconciling conflicting data on jobs for college graduates. Monthly Labor Review: 3-10.

Grasso J. T. and Shea, K. R. (1979) Vocational education and training: Impact on youth. Berkeley, CA: The Carnegie Council on Policy Studies in Higher Education.

Grubb, N. (1992, June/July). Correcting conventional wisdom: community college impact on students' jobs and salary. Community, Technical, and Junior College Journal: 10-14.

Kang S. and Bishop, J. (1986) Effects of curriculum on labor market success immediately after high school. Journal of Industrial Teacher Education 23(34): 15-19.

Kotrlik, J. & Harrison, B. (1989) Career decision patterns of high school seniors in Louisiana. Journal of Vocational Education Research 14: 47-65.

Meyer, R. H. (1981). An economic analysis of high school vocational education: The labor market effects of vocational education. Washington, DC: The Urban Institute.

McNeil, K. (1990). The case against interpreting regression weights. Multiple Linear Regression Viewpoints 17(2): 40-47.

National Post-secondary Student Aid Study. (1988). U.S. Department of Education, National Center for Educational Statistics

Shelly, K. J. (1992, July). The future of jobs for college graduates. Monthly Labor Review: 13-21.

Riccobono, J. Henderson, L. B., Burkheimer, G. J. Place, C. & Levinson, J. R. (1981). National longitudinal study: Base year (1972) through fourth follow-up (1979) data file users manual (Vol. I-III). Washington, DC: National Center for Education Statistics.

Rumberger, R. W. (1984). The incidence of wage effects of occupational training among young men. Social Science Quarterly 65(3): 775-788.

SAS Institute Inc. (1985). SAS user's guide: Statistics (5th ed.). Cary, NC: Author.

Tourangeau, R. (1987). The National longitudinal Study of the High School Class of 1972 (NLS-72) Fifth Follow-Up (1986)Data File Users Manual. National Opinion Research Center, University of Chicago, for the Center for Educational Statistics, U. S. Department of Education.

Table 1: Ordinary Least Squares Regression of Yearly Earnings: Reduced Models

Variables	Female		Male	
	Parameter Estimate	T-Value	Parameter Estimate	T-Value
College Prep.	4.06	1.85*	8.35	3.86***
Voc. Ed.	4.66	1.72*	7.97	2.70***
Total Aca Credit	-	-	.77	3.09***
Upper SES	-	-	6.69	3.54***
Married	-8.85	-4.2***	16.53	7.55***
Divorced	-	-	15.68	4.35***
College Grad.	5.57	2.63***	7.31	3.33***
Graduate School	16.37	5.32***	20.24	7.06***
Rural	-16.09	-6.755***	-13.22	-5.84***
Professional	17.147	7.87***	15.78	5.89***
Manager	29.02	10.80***	23.99	8.4***
Sales	-	-	26.55	7.19***
Craft	-	-	7.51	2.32**
Laborer	-	-	-15.11	-2.77***
Construction	14.68	1.61*	6.94	1.9*
Manufacturing	16.97	6.14***	14.02	6.20***
Communications	25.42	6.60***	19.60	5.67***
Entertainment	-21.76	-3.18***	-24.43	3.58***
Public Administration	12.96	4.40***	14.56	5.10***
	$R^2 = .163$ Adj $R^2 = .155$ Sample N = 2,657		$R^2 = .178$ Adj $R^2 = .170$ Sample N = 2,800	

* = P. ≤ .10; ** = P. ≤ .05; *** = P. ≤ .01.

Limitations on Local Accountability in Vocational Education[1]

Lawrence M. Hanser, Brian M. Stecher

RAND

---

[1] The contents of this paper are based on B.M. Stecher and L.M. Hanser, *Local Accountability in Vocational Education: A Theoretical Model and Its Limitations in Practice*, N-3561-NCRVE/UCB, RAND, Santa Monica, 1992, (also available as MDS-291, National Center for Research in Vocational Education, Berkeley, 1992), and B.M. Stecher and L.M. Hanser, *Beyond Vocational Education Standards and Measures: Strengthening Local Accountability Systems for Program Improvement*, R-4282-NCRVE/UCB, RAND, Santa Monica, 1992, (also available as MDS-292, National Center for Research in Vocational Education, Berkeley, 1992).

Abstract

We conducted interviews in five states to describe the relationships between vocational programs and constituents and to determine the extent of functional local accountability systems in vocational education. Four major conclusions emerged. First, there is widespread evidence of functioning local accountability systems. Second, local accountability systems can be described by four elements—goals, measures, feedback/influence loops, and design/reform mechanisms—and the relationships between them. Third, the quality of these components and relationships between them account for much variation in local accountability systems. Fourth, it is possible to identify practical constraints that reduce the effectiveness of local accountability systems.

Limitations on Local Accountability in Vocational Education

As concern about workforce competitiveness grows, local systems of vocational education are receiving greater attention. Within the educational system, vocational educators have been among the most concerned about students' preparation for work and the impact of education on productivity and competitiveness. Some might argue that vocational educators have been leading the debate about performance-based accountability as well. Vocational education programs have had informal accountability systems built around job training and placement for years. One reason for this greater presence of accountability may be that vocational education, by its nature, is more "accountable" than nonvocational education. Vocational programs have specific outcomes that are conceptually more straightforward and easier to monitor—preparing students for jobs—and have clearly identifiable constituents—employers—who participate in the monitoring function.

The Perkins Act has as its intent "to make the United States more competitive by developing more fully the academic and occupational skills of all segments of the population."[2] Accountability is one of the vehicles for accomplishing these goals. The Act requires the development of state and local standards and measures, state assessments, and procedures for program evaluation and improvement.[3] It remains unclear how these requirements will be translated into action or how they will affect ongoing formal or informal accountability systems at the local level.

The research represented in this report asks if accountability systems exist at the local level, and if so, how do they work? It is at the local level that a competitive workforce is either achieved or not. It is at this level that programs are initiated, continued, and canceled; that students enroll, continue, drop out, or complete; that skills are learned; and that hiring occurs and workers succeed or fail. It is only with data from the local level that we can judge the success of our system of vocational education, and ultimately it is at this level that federal and state policies either advance or hinder the competitiveness of America's workforce.

---

[2] The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 (Public Law 101-392), Section 2.

[3] Ibid., Sections 115, 116, and 117.

To learn about local accountability systems, we visited vocational education programs in five states: California, Florida, Michigan, Ohio, and Oklahoma. The selection was based on geographic diversity and the presence of one or more strong accountability-related factors, such as a statewide occupational competency system, an existing set of performance standards, or innovative occupational assessment tools.

We arranged to visit at least two local service providers in each state. Depending upon the organization of the state's vocational education system, these providers were area vocational technical schools, joint vocational school districts, comprehensive high schools, vocational high schools, and/or community colleges. At each site we interviewed administrators (e.g., the superintendent, principal, vocational coordinator, and program coordinator), instructors, students, employers, and, occasionally, parents. We spoke with approximately 20 people individually or in small groups and collected documents describing the school's goals, programs, assessments, and accomplishments.

A Conceptual Model of Local Accountability in Education

Accountability in education refers to the practice of holding educational systems responsible for the quality of their products--students' knowledge, skills, behaviors, and attitudes. A formal definition of accountability can be found in recent RAND work (Hill & Bonan, 1991):

> Accountability describes a relationship between two parties in which four conditions apply: first, one party expects the other to perform a service or accomplish a goal; second, the party performing the activity accepts the legitimacy of the other's expectation; third, the party performing the activity derives some benefits from the relationship; and fourth, the party for whom the activity is performed has some capacity to affect the other's benefits. (p.35)

Levin (1974) described an idealized educational accountability system as a dynamic, self-contained set of perceptions and responses:

> An accountability system is a closed loop reflecting a chain of responses to perceived needs or demands; an activity or set of activities that emerges to fill those demands; outcomes that result from those activities; and feedback on outcomes to the source of the demands. The feedback may generate new demands or a regeneration of the old ones; in either case, the previous set of activities may be modified or remain intact; a new or altered set of activities may be modified or remain intact; a new or altered set of outcomes may be produced; and the loop is completed again with feedback to the source of the demands. (p. 375)

Using Levin as a starting point, we elaborated a model for a local accountability system for vocational education that has several major components. Figure 1 presents a diagram of our conceptual model. It reflects both the theoretical perspectives presented above and the input we received from interviews with local constituents. It includes the following components:

- **Goals.** Organizing principles that define the purpose of the program. In the case of vocational education, goals usually focus on employment-related skills and outcomes, such as occupational knowledge and job placement.

- **Measures.** Methods for quantifying status with respect to goals. They usually are numeric summaries of system performance, such as the percentage of teachers with industry-approved certification, the proportion of students receiving free tutoring, or the number of program graduates finding employment in a field related to their course of study.

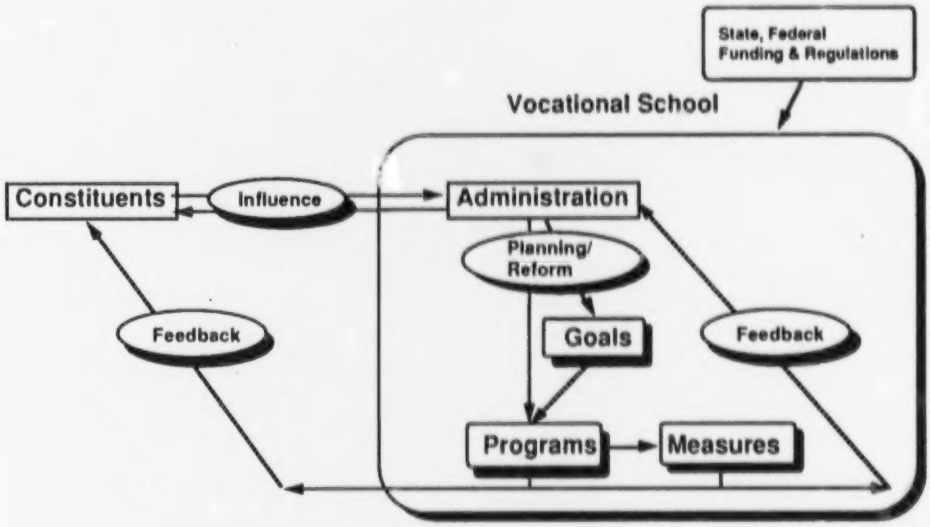

State, Federal Funding & Regulations
Vocational School
Constituents
Influence
Administration
Planning/ Reform
Goals
Feedback
Feedback
Programs
Measures

Figure 1—Model of a Local Accountability System

- **Feedback.** The transfer of information about program status to constituents and program staff. The information can include formal reports as well as impressions gained from direct experience observing, participating in, or reviewing programs.
- **Influence.** The manner in which constituents make their opinions and expectations known to program staff, and the manner in which program staff communicate to constituents. Constituents have two major vehicles for communicating their judgments: "exit" and "voice," (Hirschman, 1970).

- **Program Design and Reform.** The actions taken by administrators to form and reform programs in response to measures, to direct feedback about program performance and to constituent influence. These skills are called upon to redesign and reform programs in response to feedback and influence.

Limitations in Practice

The remainder of this paper focuses on examples of limitations to local accountability in practice as we observed them in our site visits.[4] Most of the problems we have seen can be traced back to deficiencies in goals, measures, feedback/influence loops, program design and reform mechanisms, or the interactions among these components. When one of these components is missing or weak, it interferes with the effective functioning of the entire system.

There are some constraints we will not address, including external pressures from state and federal levels and unusual local conditions that may not generalize. These can take many forms. For example, state funding formulas affect local administrators' options to change local programs, particularly their ability to initiate new programs in response to local demand; federal legislation currently mandates the adoption of statewide systems of measures that will be required of all local programs.

Finally, there are other local factors not included explicitly in the model that can affect accountability systems. These include such things as collective bargaining agreements and local political pressures. Such factors do affect administrators and instructors, particularly in their role in the change process, however, these elements are too idiosyncratic and dependent on local context to be included in a general model.

---

[4] Limited space precludes full discussion of all of them in this paper. For greater detail, see Stecher and Hanser, (1992a). For ideas on strengthening local accountability, see Stecher and Hanser (1992b).

Goals

Goals, whether explicit or implicit, form the focal point for program design, evaluation, and reform. Their position in the center of the model is not coincidental. Program design proceeds from goals, measurement and evaluation reflects back upon goals, and program reform may include the reformulation of goals. This centrality of goals and objectives is reflected in much of the literature on program evaluation (Tyler, 1942; Popham, 1975; Rossi and Freeman, 1989).

The major shortcomings that we found in goal systems were as follows:

- Higher-level goals that are not supported by interlocking goals at the action (local) level;
- Goals that are sufficiently vague or broad so that it would be impossible to know when or if they have been achieved;
- Failure to obtain understanding of and support for the goals from relevant constituencies; and
- Unstated or unclear priorities among goals.

To illustrate some of their shortcomings, we turn to specific examples of goal statements. Figure 2 shows six of thirteen sample goal statements from one of the schools we visited. Two things are obvious from the list of school goals. First, none of the goals is stated in a way that permits the school administration to know definitively whether it was met. For example, what does it mean to *assist* a student in determining individual vocational goals? And how would we know we had done it? Would a reference section in the school library on career information be sufficient? Would *every* student have to be assisted for this goal to be met? When specific levels of goal attainment are left unspecified, it is tempting to consider the goal to be an absolute or to accept any degree of success as complete success.

Assisting the student in determining individual vocational goals.

Assessing the individual's basic skills and providing prescribed instruction.

Maintaining a spirit of service which allows the school to respond to the needs of individual students.

Assisting local organizations in achieving their goals through customized training for their workers in the job skills necessary for their workplace.

The continual evaluation of the effectiveness of our instructional program and to the skill level of our student product in the world of work.

Providing opportunities for personal growth through basic vocational education and upgrading the knowledge and skills needed to keep pace with changing technology.

Figure 2—Sample School Goals

Second, because these goals are open-ended, it is clear that there are not sufficient resources available to meet every one of them—perhaps not even sufficient resources to address every one of them. Yet there is no clear priority of goals. Knowing how or when to make trade-offs among goals is further complicated by the lack of clear statements that would set a target for each goal. Would the system reduce the assessment of basic skills to fund a different level of service to special populations?

Because of the lack of clear operational definitions in these goals, this school will find it difficult to judge progress and will be frustrated by conflicting *implicit* priorities among the staff and in the community. On the other hand, the administration will always be able to say positive things about what the school is doing (if you do not have explicit goals, it is easy to say that you are achieving them or "working toward them").

Measures

Measures play an important role in an accountability system because they are the chief currency of program performance. When selected, collected, and reported properly, measures provide a common, trustworthy basis for judging the success of programs. This is crucial for determining if program reform is needed. Perkins II explicitly directs states to monitor program performance in terms of outcomes, and these requirements have led directly to the collection of measures of academic skill improvement, program completion, occupational skill attainment, and job placement.[5]

Measures are ineffective as elements of a local accountability system if they are:

- Not consonant with goals;
- Of inadequate technical quality; or
- Not meaningful to constituents.

Measures that are not consonant with goals fail to provide necessary information for program improvement. Measures that are unreliable or invalid give false signals about the status of the system. Measures that are not meaningful to constituents cannot be translated into appropriate feedback. These types of deficiencies limit the value of the measures as tools for accountability. The following examples illustrate a few of the practical limitations on measures we have encountered in vocational programs.

A set of measures fails to correspond to program goals if there are goals that are unmeasured or measured incompletely. In this situation, constituents lack objective information to judge program success. For example, if the broadly stated goal of a cosmetology program is to prepare students to be successful cosmetologists, then students' grades in cosmetology courses provide some measure of the attainment of this goal. However, grades are an incomplete measure of this goal. They do not indicate specific knowledge of key elements of cosmetology, they do not differentiate between knowledge of facts and the ability to perform the tasks associated with the job, and they do not necessarily correspond to likely success as a cosmetologist.

---

[5] As noted above, the outcome-based accountability requirements of Perkins II have lead indirectly to the adoption (at least implicitly) of these outcomes as program goals.

In comparison, it might be possible to combine a larger set of measures to judge the attainment of the cosmetology program goal. Such a set could consist of the following measures:

- A test of students' mastery of specific occupational knowledge;
- Observations of students' performance on hair care procedures;
- Measures of students' deportment and employability skills;
- Students' grades in a planned sequence of courses leading to a certificate; and
- Students' scores on state licensing examinations.

In this instance, no single measure would provide adequate data to judge the program's success in meeting its goal. However, in combination, these measures might be adequate to assess goal attainment.[6]

When goals are unmeasured or measured incompletely, people have to rely on subjective judgments about goal attainment or they have to ignore the unmeasured goals. If concerned constituents have only their own subjective impressions to use as a basis for feedback to programs, decisionmaking can more easily become politicized. Similarly, if no data are collected to determine whether the program is meeting a goal (e.g., serving students with special needs), less attention is likely to be paid to this goal (e.g., the needs of these students).

---

[6] The collection of measures is sufficient only if it provides enough information to determine whether students are adequately prepared to be cosmetologists. This question could be answered empirically by comparing performance on the measures with performance on the job. Such a comparison could establish the predictive validity of the measures. In this case, the measures may be inadequate because they do not contain any indicator of social skills, which are likely to be highly correlated with success in this particular occupation.

It is also possible to include measures that do not correspond to any goals. One must be cautious that such measures do not supplant goals and become the focus of decisionmaking. There is a natural tendency to attend to whatever data are produced and, by extension, the implicit goals they instantiate. Recent emphasis on competency testing may provide a case in point; programs may attend to test scores and the actions that can be taken to raise scores while not attending to the original goal that scores were supposed to reflect, e.g., job preparation. More generally, the mere existence of data is a powerful magnet to attention, and collecting measures that do not correspond to explicit goals can raise the implicit goals embodied in those measures to a prominence they do not deserve.

Another criterion for effective measures is meaningfulness. There are many ways in which measures may fail the test of meaningfulness in practice. Measures are of limited value if they are unclear or confusing (e.g., they are statistically complex), if they are not available in a timely manner, or if they do not address questions that are important to constituents.

Counts, tallies, and percentages reported at the student or program level are generally well understood, but not all measures are this clear. Complicated learning-style profiles or scaled results from locally constructed occupational competency tests may be too complex or obscure to be understood easily. Some of the worst problems occur when programs make "statistical adjustments." For example, one college reported that "132%, or 632 of the 477 students scheduled to graduate from a real estate training program, went on to graduate."[7] This creates an impression that the program was phenomenally successful (or ridiculously incompetent). In fact, the school had no data at all on the number of students who found jobs in real estate. It may well have been true that this measure was reliable, but it was hardly meaningful to constituents.

Timeliness is an important attribute of measures because most school-related decisions are time-dependent. Students and parents have to make enrollment choices by a particular deadline, teachers and industry advisors have to make curriculum choices prior to the start of the term, and administrators have to make hiring decisions on an annual basis. For goal attainment data to be useful, they need to be available in a timely manner.

Finally, measures should provide data that are responsive to the kinds of questions constituents are likely to ask. There may be many ways to gather information relevant to a particular goal, e.g., to serve students with special needs. Some measures will be more relevant to employers, instructors, parents, or students than others. When choices exist, schools should opt for measures that have the greatest meaning for their multiple constituencies. To be meaningful, measures must be understandable, timely, and responsive.

In conclusion, there are many ways in which measures can fail to fulfill their role in an accountability system in practice. One must not assume that because something is quantitative it is good. Nor should the reader be left with the impression that a measure is poor if it is qualitative. In both cases the important questions to ask are whether the data are consonant with goals, reliable and valid, and meaningful to constituents. These are the criteria that should be used to judge the quality of measures in a local accountability system.

---

[7] This was explained as follows: The number of students scheduled to graduate in 1988–89 was defined as 80 percent of the number of students enrolled in 1987–88. Graduates were defined as the number of students listed as Completers on the NCES 2404-A Postsecondary Enrollment and Completion Report.

Feedback/Influence

Feedback is the mechanism through which constituents and program staff learn about program performance. Such information forms the basis for their judgments about program success and their subsequent actions to influence programs. Hence, feedback is an essential element in an accountability system.

There are two sources of feedback: formal measures collected and reported by the program, and impressions and opinions formed through direct or indirect experience. Formal measures are shared with program staff and constituents in many forms, including, for example, program summary reports, evaluation reports, tabulations of outcome measures, minutes and recommendations from advisory committee meetings, and community employment projections.

Influence is the mechanism through which constituents and program staff act to affect program direction. As noted above, constituents have two forms of influence over programs: voice and exit (Hirshman, 1970). They can voice their opinions through formal channels, such as an advisory committee or a student association, or through informal contacts with staff. Such communication can be an effective way of making needs felt, influencing goals, and bringing about program improvements.

Constituents also can withhold their participation or involvement if they do not feel they are well served by the program. In many respects this is the ultimate constituent sanction. Students can leave the program or give negative recommendations to friends who are considering enrollment. At most schools, word-of-mouth has a major effect on recruitment, so dissatisfied students can affect future enrollment. Similarly, employers can refuse to serve on committees, accept interns, or hire program graduates.

For the purposes of this discussion, limitations in feedback/influence will be categorized as:

- Insufficient communication;
- Inaccurate communication; and
- Low signal-to-noise ratio—a high rate of communication with very little useful content.

Information is one key to effective action. For program administrators and staff to initiate, modify, or discontinue programs rationally (see section on organizational change mechanisms), they must have valid, reliable, and meaningful program information to guide them. For example, to the degree that instructors are isolated from local employers and do not receive feedback about employers' hiring priorities instructors will be unable to adjust program content to employers' changing needs. Similarly, to the degree that school administrators do not receive job placement information on program graduates, their decisions regarding program expansion or contraction will suffer. To the degree that community members lack information to judge the value of their local vocational education and training system, they will be unable to shape it to their needs. They may be less willing to provide the fiscal support it needs as a result.

Communication may be insufficient for several reasons. People tend to err on the side of sharing too little information rather than too much. Those who have information to communicate often feel that they have communicated more than those receiving information feel they have been given. One of the most difficult aspects of communication is judging the appropriate amount of information to share.

Second, a person may seek to influence a program by limiting the amount of information he or she communicates publicly, since the control of information contributes to the exercise of power. Those who possess information have an advantage over those who do not. Sometimes the conscious restriction of information is quite subtle. For example, business representatives who join together in program advisory committees are by their nature local competitors—e.g., beauty salon operators in the same city. This can generate considerable pressure on committee members to be less than entirely forthcoming with information. In one location, an advisory committee felt the need to have a formal written agreement concerning the use of information obtained through committee deliberations. The members believed that this agreement allowed a much freer exchange of information.

Inadequate communication also can arise as the result of ineffective organizational arrangements. For example, one community college we visited had a centralized placement office that carried out all of the placement support functions for program graduates. While this specialization appeared to be an efficient use of resources, it created an unanticipated buffer between instructors and local employers. Because instructors were not responsible for job placement, they failed to receive the natural flow of communication about employers' needs and program content that occurs during the placement process.

In some instances, there may appear to be a substantial flow of communication, yet very little useful information is being exchanged. The classic example of this is a political speech, but we do not find large amounts of noise and small amounts of content only in political rhetoric. Vast amounts of noise can masquerade as information in many other settings. In vocational education, this may take the form of undigested, unsummarized, unsynthesized, or unanalyzed statistical information. For example, schools may publish page after page of course enrollment figures. If this information is not summarized or if additional contextual information is not present (such as trends in enrollment over time or local employment figures), the information is effectively noise that the reader must sort through. This is not to say that statistical reports are worthless; rather that it can be difficult to find the key information amid the noise.

Why does this happen? Often individuals feel that all information that has been collected should be distributed. Furthermore, it takes an experienced data analyst to find appropriate ways to summarize raw data without biasing the information. One method that can be used to ameliorate this problem is to provide summary information in the body of a report or presentation and to include the raw data in an appendix. Providing only the summary or only the raw data is less likely to be satisfactory.

Communications with low signal-to-noise ratios have predictable effects. First, individuals simply cease to pay attention to the information they are given. Decisions continue to be made but without the benefit of useful information. Second, increased time is devoted to sorting through the data to find and interpret the useful information that is contained amid the noise. Third, the noise is confused with useful information, leading to inappropriate conclusions and actions.

To summarize, feedback/influence represents the flow of information conveyed by the measures *to* administrators, program staff, and school system constituents, and the flow of information *between* administrators, staff, and constituents. Problems in feedback result in inaccuracies or distortion of information that can lead to poor decisionmaking.

Program Design/Reform Mechanisms

The ultimate benefit of an accountability system is its ability to bring about program reform. Reform is the way in which the program responds to influence from constituents and to internal feedback about program success. Incremental changes to course goals, student learning objectives, instructional procedures, the structure of internship programs, etc., occur frequently in response to suggestions from employers or students or in response to formal recommendations from industry advisory committees. Similarly, instructors often make small changes to lessons and tests in response to student concerns voiced directly to them. These are some of the obvious ways constituents' influence leads to program reform on a small scale.

Organizational design and reform can falter for many reasons. In our visits to vocational schools we saw examples of decisionmaking and program reform procedures that were far from ideal. Among the shortcomings were the following:

- Regulations that limit options for change;
- Insufficient resources;
- Overattention to the needs of one constituency (e.g., employer groups);
- Giving priority to short-term demands over long-term trends;
- Difficulties balancing competing goals and principles (e.g., equity vs. placement);
- Lack of formal procedures for change; and
- Ineffective leadership for reform.

Often options for local change are constrained by state or federal regulations and funding guidelines. In one state, new program funding was available only in occupational areas where state labor market demand projections indicated growth. However, local school administrators did not believe these projections accurately predicted local demand. Nevertheless, schools could not receive state funds for new programs unless the programs appeared on the state's approved list. Other kinds of regulations can limit administrators' options for reform. One vocational school had a two- to three-year waiting list for enrollment into its nursing program, but it was not allowed to start additional classes because of limits placed on it by the State Board of Nursing.

Another factor that can reduce the effectiveness of change procedures is overattention to feedback from industry. As an example, bowling alley operators in one community made a strong case that training was needed to prepare mechanics to repair automatic pin-setting machines. The school did its best to conduct an objective survey of demand, which lent some support to industry claims. The industry advisory group was adamant that the program was needed, and they were willing to raise funds for the capital expenditures necessary to prepare the facilities. Despite its reservations, the school accepted the group's help to prepare the facilities and develop the curriculum.

The program was offered, but enrollments were insufficient to sustain it. After some investigation the school learned that the bowling alley operators themselves were withholding information from employees who might enroll. The owners were unwilling to refer employees because they did not want to pay the higher wages that trained mechanics could command. The results of the employer survey were misleading because owners had indicated "the type of employees they wanted, but not the type of employees they were willing to hire." In retrospect, the school believed it was persuaded by owners' desires without an adequate assessment of owners' commitments. The school complied with the wishes of the advisory committee, partially out of respect for the employers. Unfortunately, the space devoted to the bowling machine repair program could have been used more effectively for other programs.

A related problem occurs when schools attend to short-term demand without consideration of long-term needs. For example, one community college created a program to train pulmonary therapists based on employer surveys that projected a strong immediate need. However, the needs analysis did not estimate turnover and continuing demand in the field. The school soon found itself with a program that could no longer place graduates because all the positions had been filled.

Managing change can be difficult when administrators have to balance competing demands or competing principles. For example, one area vocational school eliminated its child care worker program despite continuing demand because the program was training women for an occupation the school identified as a low-paid, traditionally female, and "dead-end job." Administrators judged this training program to be an inappropriate use of resources that might better serve to develop more promising training opportunities.[8] In this case the school gave priority to principles over demand, to broader career-oriented goals over short-term employment goals.

Although it is an extreme case, some institutions act as if they have no mechanism for change. While effective vocational schools regularly update and redesign facilities to meet the changing training needs of their local communities, other schools seem to have little or no capacity for self-improvement. For example, one high school in an urban area provided vocational programs as part of a larger regional training consortium. The school itself did little to broaden the range of courses allocated to it or to improve the quality of its classes or facilities. One reason for this seeming indifference was that vocational education had little prestige at the school, compared to college preparatory academic education. Another reason was that the school had little power to affect the allocation of vocational courses. Either through neglect, bureaucratic inflexibility, or the absence of leadership, the school made almost no efforts to improve vocational programs or facilities. Although this example was striking, we have no reason to believe it is typical of vocational programs.

---

[8] They had not yet identified those opportunities and developed appropriate training programs at the time of our visit.

Overall, there are a number of ways in which practical constraints inhibit organizational change mechanisms. Even when goals are well articulated, measures well defined, and feedback from constituents prevalent, administrators may be ineffective in translating these elements into action. Administrators are influenced by politics and by external factors beyond their control. They are limited by their own capacities as leaders, and their actions can be affected by weaknesses in their change strategies. This includes failure to be responsive, overattention to short-term solutions, and susceptibility to pressures from vocal groups.

Summary and Conclusions

In this study we sought to examine accountability relationships in vocational education at the local level as a complement to earlier NCRVE-sponsored research on accountability at the federal level (Hill, Harvey, & Praskac, 1992). Our purposes were to investigate the nature of local accountability in vocational education and to examine the effectiveness of such local accountability systems.

To this end we reviewed the literature on accountability in vocational education, and we conducted extensive interviews with constituents of vocational programs in five states. Based on these data we developed a model of accountability at the local level and a collection of anecdotes about limitations of the model in practice. Both the model and the practical limitations should be useful in future research on accountability and on the effects of changes in federal and state policy regarding vocational education.

For example, as a result of this study we believe that accountability systems are impaired if the components—goals, measures, feedback/influence, and design/reform mechanisms—are out of balance. That is, if they differ dramatically in terms of emphasis, credibility, sophistication, and efficacy. Recent federal efforts to promote accountability in vocational education have focused primarily on measurement and, to a somewhat lesser extent, on reform. Much less attention has been given to goals and goal setting. One consequence of this emphasis on measurement is that measures may begin to supplant goal setting rather than having goals drive the choice of measures. To what extent is this occurring? What are the goals that are implicit in the measures being adopted, and how do they differ from the goals constituents hold for vocational education? These are empirical questions that might not be asked unless one has a systemic perspective on accountability. The general model of local accountability described in this study provides such a perspective, and it can help researchers generate appropriate questions.

We draw four main conclusions from this study:

- There are local accountability systems operating in vocational education programs that are distinct from state- or federally imposed standards and requirements for program review.
- These systems can be described reasonably well by a model that includes goals, measures of goal attainment, feedback from and influence by constituents, and program design and reform mechanisms.
- The quality of these components and the relationships between them account for much of the variance in local accountability.
- Practical constraints exist to limit the effectiveness of these systems.

Understanding these limitations can lead to prescriptions for improving local accountability and to better understanding of the impact of state and federal policy.

References

Hill, P.T., & Bonan, J.J. (1991). *Decentralization and accountability in public education* (R-4066-MCF/IET). Santa Monica, CA: RAND.

Hill, P.T., Harvey, J., & Praskac, A. (1992). *Pandora's box: Accountability and performance standards in vocational education* (R-4271-NCRVE/UCB). Santa Monica, CA: RAND.

Hirshman, A.O. (1970). *Exit, voice and loyalty: Responses to decline in firms, organizations and states.* Cambridge, MA: Harvard University Press.

Levin, H.M. (1974). A Conceptual framework for accountability in education. *School Review*, *82*, 363-391.

Stecher, B.M., & Hanser, L.M. (1992a). *Local Accountability in Vocational Education: A Theoretical Model and Its Limitations in Practice* (N-3561-NCRVE/UCB). Santa Monica, CA: RAND, (also available as MDS-291, Berkeley, CA: National Center for Research in Vocational Education).

Stecher, B.M., & Hanser, L.M. (1992b). *Beyond Vocational Education Standards and Measures: Strengthening Local Accountability Systems for Program Improvement* (R-4282-NCRVE/UCB). Santa Monica, CA: RAND, (also available as MDS-292, Berkeley, CA: National Center for Research in Vocational Education).

A Mosaic of Diversity: Vocationally Undecided Students and the Perry Scheme of Intellectual and Ethical Development

Hedy J. Jones
Department of Guidance and Counseling
University of Akron
Revere Local Schools
Isadore Newman
Associate Director the Institute of
Life Span Developement and Gerintology
College of Education
University of Akron
Adjunct Professor Department of Psychiatry
Northeastern Ohio Universities College of Medicine

Running head: MOSAIC OF DIVERSITY

Abstract

The Perry Scheme of Intellectual Development can assist a counselor in the discovery of diversity in vocationally undecided students. Students in a career planning class took an instrument to measure the Perry Scheme, the Scale of Intellectual Development, as well as The Career Development Inventory, My Vocational Situation, and the IPAT Anxiety Scale. Information has been provided by the Scale of Intellectual Development on this population, and the subscale of dualism appeared to have the highest validity. The commitment subscale provided additonal pieces of the mosaic of diversity, as did data about the relationships between the instruments.

A Mosaic of Diversity: Vocationally Undecided Students and the Perry Scheme of Intellectual and Ethical Development

The job of an artist in making a large mosaic of intricate design through the assemblage of small pieces of glass, can be compared to that of the vocational counselor dealing with undecided college students. Each piece of glass reflects light differently. Some are very opaque and resist the entrance of light entirely while others are very transparent and permit the light to penetrate easily, but the artist must take into account all these differences to construct the large unified picture. Vocationally undecided students also look at the world as through different colors of glass. The students have many properties in common, and yet some students have been known to resist the clarity of vision that knowledge of self and vocational choices can provide. It is the vocational counselor's role to discover the diversities and to provide the framework which will give the students the ability to see how all the pieces fit together and their place in the larger picture. Perry's (1970) scheme can be an asset to the counselor, researcher, and student in achieving this goal.

The Perry Scheme of the Intellectual and Ethical Development in the College Years

Perry's (1970) Scheme of the Intellectual and Ethical Development in the College Years addressed the need to extend Piaget's (1972) developmental theory into the period between adolescence and adulthood. To place students into their approximate positions of intellectual development, Perry used an interview technique. This process was time consuming and required trained raters. Other researchers tried to measure it using paragraph completion questions or a sentence stem format. Erwin (1981), however, attempted to measure the scheme using a multiple choice format in a Scale of Intellectual Development.

Knefelkamp and Slepitza (1976) used Perry's scheme to describe the cognitive complexity in views and issues of career decision making. Neimeyer, Nevill, Probert, and Fukuyama (1985) suggested that cognitive structure may be more related to the process involved in career planning or decision-making and that individuals may react differently to the same vocational interventions based on their cognitive levels of differentiation and integration.

Perry's (1970) scheme placed students in nine positions of development, but these were later reduced to the four that Erwin's SID (1981) attempted to measure. Erwin, when using factor analysis in the development of the instrument, found four factors and three of them followed Perry's original scheme: (a) dualism, (b) relativism, and (c) commitment. The other factor did not fit Perry's fourth position of multiplicity and Erwin suggested it as a higher developmental level called empathy.

A student with a high score in the first position of the scheme, dualism, would be expected to believe that only one path led to problem solution and that a problem had one right solution. Authority figures were expected to provide answers and "the truth".

The vocationally undecided freshman has been described as anxious, as having an external locus of control and greater dependency needs, and has appeared to fit into the dualistic position.

Multiplicity modified dualism (Perry, 1981). Students became aware of the multiple solutions possible, but were not aware that judgments could be made among them. It was implied that one solution was as good as another. This position was hypothesized as indicating a higher level of career maturity, especially in career exploration. Multiplicity was not measured by Erwin's SID (1981).

In the position of relativism, students were expected to find several correct solutions and several possible paths to problem solution. These solutions could be compared, evaluated, and judged. Perry (1981) suggested that the position of relativism was a gateway or hurdle to be overcome. This would indicate a still higher level of career maturity.

Commitment, which evolved from the position of relativism, was expected to indicate vocational decidedness in a student, a lessening of anxiety, and a still higher level of career maturity.

While empathy was not one of Perry's (1970) positions but rather one that evolved through Erwin's (1981) factor analysis, a student with a high score in empathy was expected to have developed sensitivity to other people, to have become aware of the impact made on others, and to feel responsible for the improvement of society according to Erwin (1983). This student was expected to have made the major life decisions.

Erwin's (1981) Scale of Intellectual Development

Erwin's (1981) Scale of Intellectual Development (SID) was administered to college students at the beginning and end of a one semester career planning course at a large midwestern university (Jones, 1992). The students also completed a questionnaire, My Vocational Situation (Holland, Daiger, & Power, 1980) the Career Development Inventory (Thompson, Lindeman, Super, Jordaan, & Myers, 1981) and the IPAT Anxiety Scale (Krug, Scheier, & Cattell, 1976) at the beginning of the course. The results of the study are presented in this paper.

The Sample

This sample for the study consisted of 290 students who had elected to take a career planning course at a large midwestern university. The students ranged in age from 17 to 42 with a mean of 20.2 years. There were 131 males and 156 females. Freshmen numbered 207, sophomores 51, juniors 7, and seniors 11.

The mean scores of the SID scales were different in the current study than in Erwin's (1983) study of 3,321 entering college freshmen. The means are presented in Table 1 (p. 7). The means appear to vary in the direction that would be expected for vocationally undecided students. Means are given for Erwin's original study, (1981), Erwin's (1986) four year follow-up study, and the pre and post course scores for the current study (Jones, 1992).

Table 1

Population Means on the Scale of Intellectual Development

	Dualism		Relativism		Commitment		Empathy		
	M	SD	M	SD	M	SD	M	SD	N
1981	100.0	17.0	78.0	9.5	145.0	11.0	82.0	10.0	3,321
fr. yr.	78.1	13.3	63.4	10.2	126.0	12.2	66.6	9.0	120
sr. yr.	68.7	12.4	63.6	9.2	131.8	11.4	67.9	8.4	120
1992									
pre	122.5	18.3	52.6	8.6	77.4	11.9	60.0	9.9	255
post	121.6	19.4	55.1	8.3	73.5	11.2	60.7	9.3	204

Discriminant Analysis

In the current study, several hypotheses were formed and tested. The first expected freshmen to score differently on the SID scales than seniors and looked at the criterion validity of known groups (age and year in school) on the SID. Because of the unequal numbers of students in these two categories, 54 freshmen were randomly selected for the study so that the ratio did not exceed 5 to 1. A discriminant analysis was done with the subscales of the SID, covaried with sex and anxiety, against the dependent variable of student year in school (freshman or senior). All hypotheses were found not to be significant at the .05 level of significance. Criterion validity was not supported by this analysis.

Since it was an ex post facto study results cannot demonstrate causation, but the results suggest that undecided students may be similiar in intellectual development level as measured by Erwin (1981) which is not correlated to their year in college. Self-selection into the course was not controlled, therefore the study has self-selection as a limitation. The students in this population scored very differently than did the students in Erwin's study (see Table 1, p. 7) but, again, other factors could account for this difference such as age, geographic area, and undecidedness.

Analysis of Co-variance

The second group of hypotheses predicted younger students would score differently than older students on the SID scales. An analysis of covariance was calculated to see if the SID scores would predict age over and above sex and anxiety. The relativism scale accounted for unique variance in predicting student age, but the effect size (f^2) was low ($f^2 = .01$). Older students scored significantly higher in relativism which was predicted because of their broader experiences, but other explanations need to be considered. This sample was unique in that all the students chose to be in the career planning course, and older students who made this choice may not be similar to the general population of older students. The same concept may be true for the younger students.

Commitment accounted for unique variance over and above sex and anxiety in predicting age, but the results were in the opposite direction of what had been predicted. Younger students scored higher in commitment, and older students lower. While criterion validity was not supported by results opposite those predicted, these results could be explained by the self-selection into the career planning course. When observing the data collected after all analyses were completed, it appeared that some of the younger students may have made unreasoned commitments. These unreasoned commitments may have been discarded by older students as their knowledge about vocations and their reasoning ability increased, and this could also account for the results.

Table 2

t - Tests of Differences Between Age Groups

	N	Adj. Mean	SD	df	Probability	Sign.
Age Group 1	78	81.8	12.4			
Age Group 2	87	78.9	10.9	163.0	0.1064	NS
Age Group 1	78	81.8	12.4			
Age Group 3	52	74.5	11.2	128.0	0.0009	S
Age Group 1	78	81.8	12.4			
Age Group 4	19	69.9	8.6	95.0	0.0001	S
Age Group 1	78	81.8	12.4			
Age Group 5	18	68.1	9.6	94.0	0.0001	S
Age Group 2	87	78.9	10.9			
Age Group 3	52	74.5	11.2	137.0	0.0263	NS
Age Group 2	87	78.9	10.9			
Age Group 4	19	69.9	8.6	104.0	0.0011	S
Age Group 2	87	78.9	10.9			
Age Group 5	18	68.1	9.6	103.0	0.0002	S
Age Group 3	52	74.5	11.2			
Age Group 4	19	69.9	8.6	69.0	0.1077	NS
Age Group 3	52	74.5	11.2			
Age Group 5	18	68.1	9.6	68.0	0.0323	NS
Age Group 4	19	69.9	8.6			
Age Group 5	18	68.1	9.6	35.0	0.5419	NS

Corrected = .005

F-Tests

Additional analyses were run on the age differences. For these analyses, students were divided into five age groups: (a) 17-18, (b)19, (c) 20-21, (d) 22-25, and (e) 26 and over. *F* tests were calculated to determine if student ages were significantly related to the scales of the SID. The results indicated that there was a significant difference between the age groups in commitment and *t* tests were computed for additional ad hoc analysis. Other *F* tests on the SID scales of dualism, relativism, and empathy were insignificant at the .05 level. The results of the *t* tests for the commitment scale are presented in Table 2 on page 9.

Repeated Measures Dependent t Test

Looking at vocationally undecided students scores on the SID at the beginning and end of a career guidance course, resulted in the identification of some significant changes. Dualism scores dropped significantly ($p < .0008$) as hypothesized when class and instructor were covaried. This finding supported the predictive validity estimate for the dualism scale of the SID. Commitment scores were significantly lower instead of higher as had been predicted. One of the reasons mentioned earlier, that it was the unreasoned commitments that declined, may account for the result. It may also be that the lowering of dualism scores from the application of learnings in the course accounted for the change in commitment scores (students altered their thinking that only one right career existed for them), or other reasons not under the control of the researcher.

Table 3

SID and MVS Correlations

Pre-Career Planning	Dualism	Relativism	Commitment	Empathy
MVS Vocational Identity	+.036	+.228*	-.456**	+.015
MVS Barriers	+.098	+.001	-.151*	-.001
MVS Information	+.053	+.161*	-.070	+.065

* $p < .05$ **$p < .0001$

Dualism was found not to be significantly related to scores on the MVS scales, nor was empathy. Relativism, however, was significantly and positively related to the Vocational Identity Scale (MVS-VIS) as it was to the Information scale (MVS-IF) but the correlations were low. In a regression analysis the results were similar. The relativism scale was significantly related to the MVS-VIS ($p < .01$) and to the MVS-IF ($p < .03$) when sex and anxiety were covaried. A significant relationship ($p < .01$) was also found between the relativism scores and the IPAT Anxiety Scale (IPATAS) when sex was covaried. The relativism scale did not have a significant relationship with any of the CDI scales when sex and anxiety were controlled.

The SID commitment scale, in the regression analysis, showed a significant relationship to the MVS-VIS ($p < .01$) when sex and anxiety were covaried. The commitment scale was significantly related to the Barrier Scale (MVS-B) when covaried for sex ($p < .05$), but not when covaried for anxiety. The same relationship was found in the correlation matrix (MVS-VIS: $r = -.456$, $p < .0001$; MVS-B: $r = -.151$,

$p < .05$). Commitment and the IPATAS also showed a significant relationship when controlling for sex ($p < .01$).

High scores on the scales of the MVS indicate career maturity. Low scores in vocational identity appear to be significantly correlated with high scores in commitment and this appears to support the possibility that vocationally undecided or uncertain students who score high in commitment on the SID do not have a clear idea of their own attributes or did not go through the process of vocational planning.

Students tending to have high scores in commitment and low scores on the barrier scale, may indicate students in career planning courses who are committed to a major or career but are aware of barriers to this course of action and may be looking for other alternatives. The relationship of high anxiety scores to high commitment scores could further suggest that students in career planning courses are anxious if they already have made a commitment to to a career or course of study but recognize possible problems with their choice.

These combinations of scores may also suggest that the commitment scale may be measuring an unreasoned commitment rather that Perry's (1970) definition of commitment. The commitment scores were significantly and negatively related to all the scales of the Career Development Inventory (CDI) except for the knowledge of perferred information scale ($r = -.103$) which was negatively related but not with significance at the .05 significance level (see table 4, p. 13). This correlation analysis further supports the reason vs unreasoned commitment interpretation.

In the multiple regression analysis, commitment was also significantly related to all the scales of the CDI, except for knowledge of preferred occupation when controlling for sex and anxiety. Commitment was also found to be nonsignificantly related to decision making when sex was covaried.

Table 4

CDI and SID Correlations

Pre-Career Planning	Dualism	Relativism	Commitment	Empathy
Career Planning	-.015	+.088	-.405**	-.102
Career Exploration	-.004	-.004	-.257**	-.114
Decision Making	+.305**	-.092	-.138*	-.138*
World of Work Inf.	+.342**	-.077	-.181*	-.151*
Preferred Occupation	+.163*	+.070	-.103	-.020
Career Dev. Attitudes	-.001	+.062	-.427**	-.126*
Career Dev. Knowledge	+.391**	-.095	-.175*	-.171*
Career Orientation Total	+.274**	-.028	-.412**	-.212*

* p< .05 **p< .0001

In addition to the correlations between the SID scales and the MVS, CDI, and IPATAS, the correlations between the vocational instruments are reported in Table 5 on page 14. These correlations further discribe the mosaic of diversity.

Anxiety was found to be nonsignificantly correlated with the CDI scales except for the career development attitude scale ($r = -.122$, $p < .05$) which is a combination of career planning and career exploration. This relationship suggests that activity in both career planning and career exploration may reduce student anxiety. However, the MVS scales were found to be significantly and negatively correlated with the IPATAS scales (see Table 6 on page 14).

Table 5

Correlations Between MVS and CDI

CDI Scales	MVS Vocational Identity	Barriers	Information Scales
Career Planning	+.422**	+.027	+.217*
Career Exploration	+.194*	-.035	+.103
Decisionmaking	+.018	+.043	-.076
World of Work	-.046	+.081	+.069
Knowledge Pref. Occ.	+.063	+.109	-.003
Attitude	+.406**	+.012	-.212*
Knowledge	-.022	+.070	-.012
Career Maturity Total	+.257**	+.063	+.134*

* p< .05 **p< .0001

Table 6

Correlations Between MVS and IPATAS

IPATAnxiety	Covert Anxiety (A)	Overt Anxiety (B)	Total
MVS Vocational Identity	-.194*	-.274*	-.261**
MVS Barriers	-.186*	-.225*	-.227*
MVS Information	-.150*	-.159*	-.173*

* p< .05 **p< .0001

These correlations between the MVS and anxiety, suggest construct validity for the MVS. Research has suggested that there is a relationship between anxiety and vocational maturity are in undecided college students, and the correlations were in the expected negative direction (high anxiety and low vocational maturity).

Conclusions

1. Students taking the career planning course appeared to be dualistic as had been predicted, and the Dualism Scale of the SID may be the most accurate measure of the Perry Scheme by the SID for this population. It appears sensitive to changes and correlates in the hypothesized direction with other instruments. While looking at correlations with the other instruments, dualism as measured by the SID may reflect Perry's early research on the authoritarian personality and dogmatism.

2. The Relativism Scale of the SID may be in need of expansion or revision to make it more sensitive to changes over time and differences in the student population. It did not significantly change in Erwin's 1986 four year study and it did not show a significant relationship to any of the CDI scales. It did, however, relate significantly to the MVS-VIS and MVS-IF in the direction expected for a relationship between the discovery of relativism and career information and identity. High vocational identity and information scores significantly correlated with high relativism scores.

3. The Commitment Scale appears to measure an unreasoned commitment, in this population, as well as or rather than the more limited reasoned commitment suggested by Perry (1970). This was suggested by the consistantly negative and significant correlations to the other vocational instruments. Unreasoned commitment could also be hypothesized by the significant and positive correlations to the anxiety measures. With reasoned commitment, it would have been

expected that anxiety scores would decrease. While the commitment scale did not appear to be a good measure of the Perry (1970) scheme for this reason, it did appear to give information about these vocationally undecided students over the semester career planning course. A decrease in commitment scores on the SID in this population over the semester may be hypothesized as a change for the better. This could be further demonstrated if anxiety scores decline with the commitment scores, and this additional research is needed. It may be wise to keep in mind, however, that this was a limited population and the mean score in commitment was already lower than in the Erwin (1983,1986) studies.

4. The inclusion of the empathy scale in an instrument to measure the Perry scheme has not been justified by Erwin (1983) or Jones (1992). In the various tests of significance done in this study, the empathy scale did not appear to add any significant information about the population. Even though this scale was developed through Erwin's (1983) factor analysis, It may be wise to keep in mind what Newman (1971) stated: "Just because a factor is produced by a factor analysis solution does not mean that that factor is meaningful" (p. 55). The data for this study (Jones, 1992), and Perry's (1970) research do not support Erwin's empathy subscale.

Implications

Heuristic findings of this study may be found in the correlation matrix indicating relationships between the findings. These results are inconsistent in that they impart support for expected relationships as well as those that are contrary to theoretical expectations. The findings in this study bring to light needed research to explain the inconsistancies.

The mosaic that emerged from this analysis may be discriptive only of vocationally undecided students. These students may be a unique population, but they may be the most critical to understand because these are the students who most need or seek counseling.

References

Chickering, A. W., & Associates. (Eds.). (1981). The modern American college: Responding to the new realities of diverse students and a changing society. San Francisco: Jossey-Bass.

Erwin, T. D. (1981). The Scale of Intellectual Development. Texas A. & M. University.

Erwin, T. D. (1983). The Scale of Intellectual Development: Measuring Perry's scheme. Journal of College Student Personnel, 24, 6-12.

Erwin, T. D. (1986). Students' contribution to their college costs and intellectual development. Research in Higher Education, 25 (2), 194-203.

Holland, J. L., Daiger, D. C., & Power, P. G. (1980). My Vocational Situation. Palo Alto, CA: Consulting Psychologists Press.

Jones, H. J. (1992). Validity estimates of the Scale of Intellectual Development. The University of Akron. Unpublished dissertation. Akron, OH.

Knefelkamp, L. L., & Slepitza, R. (1976). A cognitive-developmental model of career development: An adaptation of the Perry scheme. Counseling Psychologist, 6 (3), 53-58.

Krug, S. E., Scheier, I. H., & Cattell, R. B. (1976). Handbook for the IPAT anxiety scale. Champaign, IL: Institute for Personality and Ability Testing.

Neimeyer, G. J., Nevill, D. D., Probert, B. & Fukuyama, M. (1985). Cognitive structures in vocational development. Journal of Vocational Behavior, 27, 191-201.

Newman, I. (1971). A multivariate approach to the construction of an attitude battery. Unpublished dissertation, Southern Illinois University.

Perry, W. G., Jr. (1970). Forms of intellectual and ethical development in the college years: A scheme. New York: Holt, Rinehart & Winston.

Perry, W. G., Jr. (1981). Cognitive and ethical growth: The making of meaning. In. A. W. Chickering (Ed.), The modern American college: Responding to the new realities of diverse students and a changing society (pp. 76-116). San Francisco: Jossey-Bass.

Piaget, J. (1972). Intellectual evolution from adolescence to adulthood. Human Development, 15, 1-12.

Thompson, A. S., Lindeman, R. H., Super, D. E., Jordaan, J. P., & Myers, R. A. (1981). Career Development Inventory. Palo Alto, CA: Consulting Psychologists Press.

Dropout in senior vocational education

Ineke Lokman

RION, Institute of Educational Research
University of Groningen
The Netherlands

Abstract

Every year about 210.000 (30%) Dutch students at the age of 16 till 19 participate in senior vocational training. The success rate of the courses is low. Since September 1987, the careers of 4,658 students in senior vocational training have been followed in order to answer the question why so many students drop out. The method of event history analysis is used to analyze when students drop out. The results show that the dropout rate is 36%. Students are most likely to dropout at the end of the school year. Plans for further schooling decrease the rate. Other variables related to dropout are age, previous education and motivation.

Dropout in senior vocational education

In the Netherlands there is a categorized educational system. The system is described in figure 0 (appendix). Children at the age of 4 - 12 are educated in primary education. Until recently, pupils had to choose after primary education between junior vocational education and different levels of secondary general education (junior and senior secondary general education and pre-university education). In the near future, the first years of the courses mentioned above will be more integrated, so the moment at which the pupils must make their choice will be postponed.

In 1987 the Dutch government has launched a campaign for senior vocational training with the slogan 'choose a profession, then you easily get a job'. This campaign that lasted for three years was started because of the expected decrease of the number of students in junior and senior vocational education. Another goal was to do something about the negative image of vocational education compared to general education. In 1990 the campaign was continued on the pretext of 'with a vocational graduation, you make it to the top'. In the Netherlands, the government aims for a qualification on the level of apprenticeship for each student. Nevertheless, the dropout rate in vocational education is high. Because of this, not many students achieve the desired qualification level. As a consequence the shortage of skilled laborers on the labor market cannot be filled.

The central issue in this paper is dropout in (full-time) senior vocational education. More particularly, it deals with the way dropout is defined and determined, which students drop out and why. In section 3 the different aspects of dropout will be discussed further. It will result in a number of research questions. The design will be described in section 4. In the fifth section the results will be presented. Concluding remarks will be made in section 6.

First, senior vocational education will be described in the following section.

Senior vocational education

Senior vocational education consists of four main courses: agricultural training, technical training, economic and administrative training and service trades and health care training. The Ministry of Education and Science is not responsible for agriculture training, so this is left out of consideration in this paper. Every year, respectively about 81,000, 60,000 and 68,000 students participate in the remaining courses (CBS, 1990). This is about 30% of the Dutch students at the age of 16 - 19. The technical course is a four years' training. Economic and administrative training and service trades and health care training take three years. The inflow into senior vocational training is mainly coming from junior vocational and general education. Table 1 presents the various educational courses, where the students in senior vocational education come from and corresponding proportions.

Table 1 Inflow into senior vocational training

	technic	economics	services /care
from junior vocational education (same type)	37%	7%	25%
from junior secondary general education	50%	86%	51%
from senior secondary general education	5%	4%	5%
from somewhere else	8%	3%	11%

After senior vocational training students can leave the educational system or can get on to further schooling in vocational colleges. If the students are leaving school without having graduated they can follow short vocational training or make use of the apprenticeship system if they want to have further education. Short vocational training does not have entry requirements. Dropouts qualified for junior secondary general education are also admitted to senior secondary general education.

Theoretical background

Figures concerning the extent of dropout in vocational education vary a great deal. This has two main causes. In the first place different definitions are used. Sometimes only students who leave full-time education are counted as dropouts. In other studies a broad definition is used: 'dropouts are all the students who leave school, regardless of what they are going to do afterwards'. These different definitions lead to different dropout rates, because many students indeed make a transition to another school. This is typical of the Dutch educational system, in which students from junior vocational and general education at the age of 16 have to choose a (vocational) training without knowing very much about the subject matter and the occupations they will be trained for. So dropping out of school has not always quitting full-time education as a consequence. In this paper both definitions will be considered by focusing on school changers as well as on school leavers (without graduation).

In the second place there is uncertainty about the precise dropout rate, because studies mostly focus on whether or not drop out occurs and not when dropout occurs. Focusing only on whether or not dropout occurs, brings in a loss of information, because it ignores possible time-dependency of dropout occurrence. Besides, it does not yield comparable results if the studies are not covering the same period of time. To avoid these difficulties, it is tempting to use the length of time from inflow to dropout as the dependent variable in a multiple regression. However, this design produces problems for the analyses, because the dependent variable is missing (also called 'censored') for students who do not drop out of school. Furthermore, no time-dependent explanatory variables can be modelled with the usual methods of analysis. Event-history analysis is a relatively new method that deals with these problems. It is a method for analyzing when the occurrence of an event is most likely (Willett & Singer, 1991). This will be discussed in more detail in section 3.

On the basis of these considerations, the following research questions concerning the extent of dropout can be formulated:

- how many students drop out of school and what are they doing afterwards (how many students are school leavers and how many school changers)?
- at which moment in their (senior vocational) school career are students most likely to drop out?

The next question that can be formulated is which students are at greatest risk to drop out. Many studies show that there is still a relation between the school career and the socio-economic background of students (see among others Bosker, 1990). These results have been confirmed in senior vocational education (Groothuis & Mildert, 1984; Reenders & Van der Velden, 1984, Stichting Vakonderwijs Drenthe, 1982). Also important is the school career that preceded senior vocational education. This is not only because of the difference between junior vocational and general education, but also because of the time taken over primary and secondary education. Among the dropouts are more students from junior vocational education and more students who have once repeated a school year (which made them older than 'stayers'). Motivation also plays a part in whether or not dropout occurs. Further, girls seems to be at greater risk. Relations between socio-economic background, previous education, age, gender and drop out have been proved in all studies.

Finally, the question remains why these students drop out more often than others. There are several ways to answer this question. Firstly, dropouts themselves can be asked for their reasons for leaving school or going to another school. Secondly, the explanation can be found in other variables. Dropout decisions can be understood within the framework of the human capital theory. According to this theory, the decision whether or not to participate in education is the result of a cost-benefit analysis. The most important benefit is a higher future income. The human capital theory has been criticized for regarding education mainly as an investment and disregarding other non-monetary aspects (Kodde, 1985).

Our hypothesis is that not only future earnings are important but that also career perspectives determine dropout decisions. Perspective seems to be an important component for career decision making (Savickas, Silling & Schwartz, 1984). Blustein (1988) found a relation between future orientation and planning and crystallization and commitment to career preferences. Research by Reich & Young (1975) has shown that school stayers have a more defined view of the future than dropouts.

Furthermore, from literature a connection can be derived between perspectives and student characteristics related to dropout. Students from lower socio-economic backgrounds are more short time orientated and work is important to them. Students from higher socio-economic backgrounds have a more long term orientation in which continuing study takes an important part (Raad voor het Jeugdbeleid, 1991). Furthermore, students in secondary general education have vague and unstable career preferences (Meijers, 1991). Also a relation is found between having a deep career perspective and motivation for school (Peetsma, 1992). Girls restrict their choices by orientating on work and family both (Peetsma, 1985).

The hypothesis that can be made on the basis of these results (concerning dropout and career perspectives) is that the effects of student characteristics (gender, socio-economic background, age, previous education and motivation) on dropout are the results of differences in career perspectives. The following research questions can be formulated:

- what reasons cause dropout according to the dropouts themselves?
- which students are most likely to drop out?
- do dropouts and students staying at school differ in their career perspectives?
- will there still be effects of student characteristics on dropout if differences in career perspectives are taken into account?
  (or: are career perspectives the actual reasons for students with certain characteristics to dropout)?

Design

Data

The data used in this paper have been collected as part of a longitudinal study on educational and occupational careers in and after senior vocational training. The survey started in 1987 with 43 schools. In 1988 16 schools were added to this sample. In total, the careers of 4,658 students, who participated for the first time in senior vocational training, have been followed. Student characteristics were measured at the beginning of the course. In addition, students (who were still attending school) were asked about their career perspectives and motivation at the end of each school year. So, the number of times a questionnaire has been filled in differs from student to student. It depends on the period students are in senior vocational education. Dropouts have been asked about their reasons for dropping out of school and about their activities afterwards approximately one year after they have left school. In addition to the information collected from the students, information concerning student results were obtained from the school.

Variables

Perspectives

- plans for the future (after finishing senior vocational training) (0=(probably) working, 1=continue studying)

- have a particular occupation in mind (0-no, 1-yes)
- clearness of future occupational prospects (1-unclear, 2-somewhat clear, 3-clear)

Student characteristics

- age at the beginning of the course (an age above 17 means that the student has repeated one or more school years in previous education)
- gender (0-boy, 1-girl)
- highest level of education before senior vocational education. This variable is converted into an one-zero variable: junior vocational education (0-no, 1-yes)
- socio-economic background is measured by means of the education level of the father and the mother. Both variables range from 1 (primary education) to 8 (university) and are considered as interval variables.
- achievement motivation. This variable is composed of 5 items (appendix 2). The reliability of the motivation scale is .74 (Cronbach's alpha). Achievement motivation is measured three times, namely at the beginning and the end of the first year and at the end of the second year. The motivation scores are respectively used for the first, the second and the third and following years. (1-motivated to 4-unmotivated).

Furthermore, the PSB3-sub-test (Horn, 1969) has been used to measure intelligence. It concerns the non-verbal part of intelligence. The test consists of 40 items. The final score is a score adjusted for age from 0 to 9. This variable will be used because students can be expelled from school for too low achievements. In this case dropout is not a matter of choice.

Method

Event history analysis will be used to estimate when and which students run the risk of dropping out. This will be done by means of the statistical package BMDP. In these analyses, the hazard rate is the dependent variable (see Allison, 1984; Blossfeld, Hamerle & Mayer, 1989, Tuma & Hannan, 1984). The hazard rate can be interpreted as the probability that the school is left during a time-interval, given that it was not left before. So, only the students who are still at school are used each time in calculating the probability. The number of students attending school at each particular point of time is called the risk set.

The dropout moment is not exactly known, only month and year are asked for. Therefore the time-interval is a month. Dropouts will be divided into students who have changed to another school and students who have left full-time education. The former will be indicated as school changers from now on, the latter as school leavers.

There are different models for estimating the hazard rate. Because no particular hypothesis about the probability of dropout over time have been formulated the Cox model will be used. The Cox model is a semi-parametric function in which the hazard rate does not have to be specified with respect to time. Besides, it is possible to admit time dependent covariates in the model.

The model looks as follows:

$$\log h_{(t)} = a_{(t)} + b_1 x_1 + b_2 x_{2(t)}$$

at which $a_{(t)}$: a not further specified function of time
x_1: a time independent explanatory variable
x_2: the value of a time dependent covariate on time t
b_1, b_2: estimated constants

Each dropout type will be analyzed separately, just as each course.

Results

Non response

If no distinction is made between school changers and school leavers, about 36% of the participating students drops out of school. The destination is unknown for more than 10% of the dropouts (not responding students). These students cannot be used in the event-history-analyses.

Table 2 Dropout rates

	technic	economics	services/care
N (total)	726	3296	636
no dropout	62%	62%	68%
dropout			
- school changers	9%	13%	10%
- school leavers	17%	11%	13%
- destination unknown	12%	14%	9%

The characteristics of not responding students are compared to those of the responding students, to say something about the selectivity of the fall offs. In technical training differences are found for two variables. Responding students are on average a little bit younger and have a higher intelligence score than not responding students. The same goes for economic and administrative training. Besides this, in economic and administrative training responding students are also more often boys. No differences are found in trade services and health care training. The somewhat deviating response group and the fact that the true dropout rate is higher than reported, must be taken into account when interpreting the results.

When students drop out

Figures 1, 2 and 3 present the hazard rates for changing school in secondary vocational education courses.

Figure 1 Hazard rate of school changing in technic

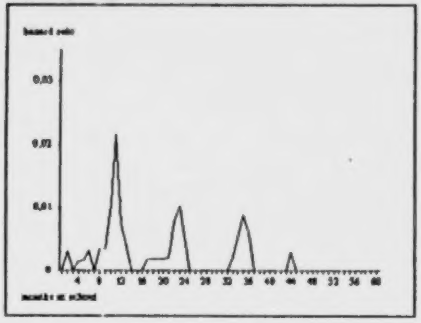


Figure 2 Hazard rate of school changing in economics

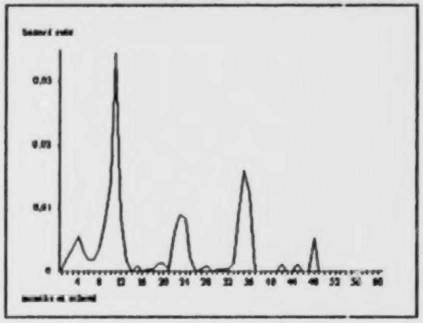
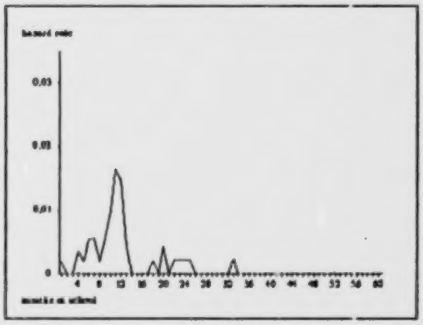


Figure 3 Hazard rate of school changing in services



Several aspects can be deduced from the figures. Firstly, the highest peaks are between the eighth and the twelfth month. This means that the students are most likely to drop out at the end of the first school year. The lower peaks around the twenty-fourth and the thirty-sixth month indicate a preference for changing school at the end of a school year later in the course also. Furthermore, the figures show that changing school happens most often in economic training. In services and care training school changing occurs mainly in the first year.

Figures 4, 5 and 6 present the hazard rates for leaving school in secondary vocational education courses.

Figure 4 Hazard rate of school leaving in technic

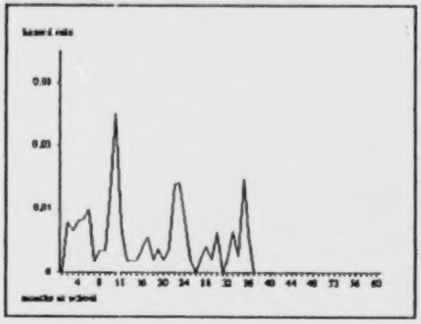


Figure 5 Hazard rate of school leaving in economics

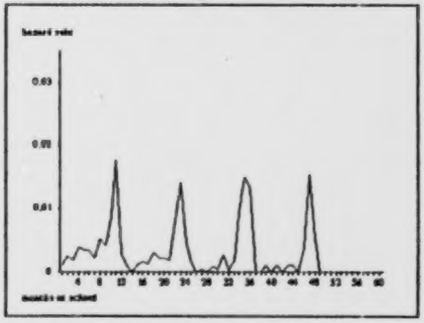
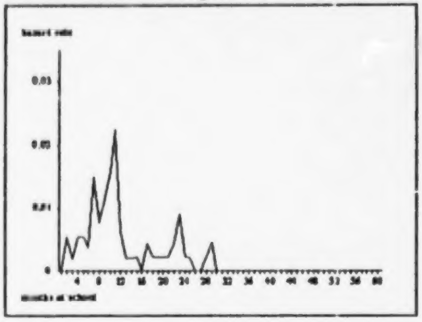


Figure 6 Hazard rate of school leaving in services



The pattern of leaving school differs a little in comparison with the risk of changing school. In technical training and services and care training the leaving school rate is somewhat higher, which implies that the probability of leaving school is higher than the probability of changing school. Furthermore, leaving school is a little bit more scattered over the school year and over the course.

Why students drop out

By means of the questionnaire students filled in a year after they dropped out, information is gathered about the reasons for changing and leaving school. The reasons most often mentioned are presented in Table 3.

Table 3 Reasons for drop out

	technic		economics		services /trade	
	sc	sl	sc	sl	sc	sl
the school was too difficult	20%	15%	13%	14%	9%	15%
failed to pass a school year	19%	22%	19%	21%	5%	8%
the school was too theoretical	12%	21%	13%	8%	2%	7%
the subject matter had little appeal	10%	7%	8%	8%	14%	14%
the future occupation had little appeal	19%	10%	9%	11%	34%	25%
got a job	0%	4%	0%	6%	0%	6%
wanted to make money	0%	2%	0%	3%	0%	3%
the school was too easy	2%	2%	0%	0%	5%	0%
no good relationship with teachers	3%	0%	9%	3%	7%	4%
removal (change address)	3%	3%	2%	0%	2%	0%
private circumstances	2%	14%	3%	2%	5%	1%
otherwise	10%	14%	24%	24%	17%	17%

sc = school changers
sl = school leavers

Many dropouts had to repeat the school year if they had stayed at school. So, in technical and economic training this is an important reason to leave or change school. The total number of students dropping out of school because of the difficulty level is a little bit higher for school leavers than for school changers. Getting a job and the desire to make money are reasons to quit for only school leavers. A bad relationship with teachers causes more dropout for school changers than for school leavers.

The table shows that in technical training most reasons for changing school have to do with the level of schooling, while in services and care training the appeal of the subject matter and future occupation seem to be of the most importance. As it turns out in Table 4 a large number of students in trade services and health care training change to other services and care courses (from a dentist's assistant to geriatric helper for instance). It is more unclear why students in economic training change school. This is to a lesser degree the result of the level and the subject of the course. This can also be deduced from the high percentage of students continuing their course in another school. In economic training, school changing probably has to do with more school specific reasons, like instruction methods and class organization.

Table 4 Education after school changing

	technic	economics	services /trade
short secondary vocational education	36%	17%	22%
senior vocational education-same type	13%	47%	32%
senior vocational education-other type	38%	26%	34%
senior secondary general education	7%	7%	5%
something else	6%	3%	7%

The table below shows the destination of the school leavers that are working, training on the job (apprenticeship), accomplishing military services and unemployed.

Table 5 Activity after school leaving

	technic	economics	services /trade
work	36%	57%	63%
apprenticeship	39%	23%	29%
accomplish military service	22%	7%	1%
unemployment	1%	8%	6%
something else	2%	5%	1%

Which students drop out

As has already been said in section 3, this question can be divided into a number of sub-questions, namely which students are most likely to drop out, do dropouts and students who stay at school differ in their career perspectives and will there still be effects of student characteristics on dropout if differences in their career perspectives are taken into account. The effects of student characteristics will be counteracted only if those variables are related to career perspectives. Therefore, first it will be checked if this hypothesis is confirmed.

The perspectives were measured several times (6 times maximally), namely at the beginning of the course and at the end of each school year (from students still at risk). Per measurement t-tests and correlations between student characteristics (gender, previous education, socio-economic background, age and motivation) and perspectives are calculated. In these analyses, the problem arises that the risk set (students still at school) becomes smaller and more specific. It is checked if, in spite of this problem, the effects are reasonably stable. Therefore only the first four measurements are analyzed. Because of the indicative character, a significance level of 0.10 is allowed. The table below summarizes the number of significant relations and the direction (in case of consistency).

Table 6 Perspectives and student characteristics

	gender	prev. educ.	educ. fath.	educ. moth.	age	motiv.
Plans for further education						
- technical	2	4 -	2 +	3 +	4 -	2 +
- economics	4 -	4 -	4 +	4 +	4 -	2 +
- services/care	2	4 -	4 +	4 +	3 -	0
Particular occupation in mind						
- technical	2 +	2 +	0	0	3 +	3 +
- economics	4 +	1	2	1	1	4 +
- services/care	0	1	1	3 -	2 -	3 +
Clearness of occupational prospects						
- technical	0	1	2 +	0	3 +	4 +
- economics	4 +	1	0	0	1	3 +
- services/care	4 +	0	1	0	1	1 +

Most relations were found between student characteristics and plans for further education. On average, students from junior vocational education less often intend to follow vocational colleges, just like older students. A positive relation was found between the intention to continue a study and socio-economic background. In only a few cases a significant relation between motivation and plans for further education was found, but if this was the case, students intending to work are less motivated. Girls have a better idea of the occupational prospects and more often know what they want to become, although this is not the same in each course. Except for gender and motivation, no other student characteristics seem to be related to occupational perspectives.

In summary, it may be said that all student characteristics are related to one or more perspective variables. So no effects of those characteristics on drop out will be expected if career perspectives are taken into account.

The next step is to analyze what variables predict dropout. Several event history analyses have been done. In each analysis, only one explanatory variable is modelled (so, the effect of a variable is calculated without considering the other variables). The separate effects of the variables are presented in the table below.

Table 7 Separate effects on dropout

	school changing			school leaving		
	techn.	econ.	serv.	techn.	econ.	serv.
perspectives						
plans for further schooling	0.40*	0.54*	0.40*	0.14*	0.40*	0.27*
particular occupation in mind	0.80	0.71*	0.47*	0.96	0.79+	0.42*
clearness of occupational prospects	0.87	1.13	0.63	1.35+	1.01	0.98
student characteristics						
intelligence	1.03	0.94+	0.89	0.94	0.96	1.01
gender	0.93	0.85	1.04	0.25	0.95	0.61+
junior voc. educ.	0.71	2.38*	1.03	1.24	1.77*	1.64*
educ. level father	1.05	1.13*	1.09	0.96	1.04	1.04
educ. level mother	1.15	1.14*	0.95	0.96	1.06	1.01
age	1.02	1.29*	0.87	1.27*	1.72*	1.09
motivation	0.99	1.08	1.67+	1.50*	1.38*	1.58*

* significant on the level of 0.05
+ significant on the level of 0.10

The effects presented in the table can be interpreted as follows. Because the analyses are logliniar the effects are exponents of regression coefficients: so, the effects are always greater than zero. This does not mean that only positive relations can be found. If the exponential regression coefficient is higher than 1, a higher score on the variable concerned has an increasing probability of dropout as a consequence (it increases the hazard rate). If the exponential regression coefficient is lower than 1, a higher score decreases the hazard rate (so the conditional probability of dropout). The effect size can be calculated as follows: (exponent (regression coefficient) - 1) * 100%. Consequently, the effect size of the variable plans for further schooling in technical training is (0.40-1)*100%--60% . So for students intending to go to vocational colleges the probability of school changing decreases with 60%.

The table shows that plans for further schooling is the most effective variable concerning perspectives. Furthermore, not many of the expected effects of student characteristics have been found. Student characteristics related to school changing have effects (at significance level of 0.05) in economics and administrative training only. For this reason, in technical and services and care training (where no student characteristic at all is important) it is pointless to check the effects of student characteristics on changing school if perspectives are taken into account (the last research question). With respect to leaving school the situation is somewhat unclear. Concerning this type of dropout the last analyses have been done for all courses. In these analyses all variables have been modelled. Next, not significant variables have been removed step by step. Table 8 shows the final model with the remaining variables (significant on the 0,05 level).

Table 8 Effects on dropout

	school changing	school leaving		
	econ.	techn.	econ.	serv.
plans for further schooling	0.54	0.16	0.32	0.29
particular occupation in mind	0.76			0.44
gender				0.48
junior vocational education	2.31		1.54	2.07
educ. level of the father	1.15			
age	1.22	1.33	1.68	
motivation (-)		1.57	1.38	1.60
Chi-square	86.22	57.58	166.17	36.57

At first the results concerning changing school in economic and administrative training will be discussed. As the table shows having plans for further schooling and having a particular occupation in mind is important. For students intending to go to vocational colleges the probability that they will change school decreases with 46%. The rate decreases also for students with a particular occupation in mind. Furthermore, older students from junior vocational education and/or with higher socio-economic backgrounds are more likely to change school. From this we can conclude that student characteristics still have an effect on school changing when differences in career perspectives are considered. In comparison to Table 7 only the educational level of the mother is not significant anymore, but that is possibly due to admitting the educational level of the father in the model. The effects of the student variables are all counter-productive.

Schooling intentions also have a predicting value in leaving school, while having a particular occupation in mind is not important any longer (except for services and care education). Student characteristics with a significant effect in at least two courses are previous education (junior vocational education or not), age and motivation. For less motivated students the risk of leaving school is about 40% (economics) to 60% (services/trades) higher. Moreover, older students are more likely to leave school just like students from junior vocational education. Again, the student characteristics keep significant effects. The effect sizes do not change much, either.

Discussion

In the Netherlands the success rate of vocational education has received more attention in the last few years. Results from recent studies show that 1% to 30% of the students participating in part-time vocational education drop out of school (Van Batenburg & Haanstra, 1992). The apprenticeship systems have success rates varying from 34% to 76% (Den Boer & Meesterberends-Harms, 1992). This paper attempts to gain more insight into dropout in senior vocational education.

For students who started senior vocational training in 1987 or 1988 the dropout rate is about 35%. This rate may increase the next years because there are still students of the cohort participating in senior vocational training. But, there is not much chance that this will happen, because dropout occurs mainly at the end of the first school year. During the past year, dropout occurred only in economic training. Not all dropouts leave the educational system, more than 10% make a transition to another school. These students differ from students leaving full-time education in several ways. Appeal of the subject matter and future occupation are the main reasons why they change school, while the level of difficulty is the most important reason for leaving school. The school changing process seems to be difficult to predict. No relations with student characteristics were found in technical and trade services and health care training. Previous education, socio-economic background and age have significant effects in economic and administrative training, but the effects are not in the expected direction; they increase the hazard rate.

More relations were found between student characteristics and school leaving. In economic and services and care training there are more students from junior vocational education among the school leavers. Older students, just like unmotivated students are more likely to leave school.

The results show that perspectives play an important part in dropout. Mainly plans for further education (an attitude towards schooling) are related to dropout. Of all variables measured, this variable is one of the best for predicting school changing as well as school leaving. School changing is sometimes related to a lack of occupational preference before dropout occurs. The reasons that students have given for changing school have already shown this. It means that counselling school and occupational choices will possibly decrease the rate of school changers.

A final remark concerns the hypothesis made that effects of student characteristics would be counteracted if perspectives were taken into account. This hypothesis must be rejected. Although students differ in their perspectives, the effects continue to exist. So, there are other reasons why older, unmotivated students from junior vocational education or with lower socio-economic backgrounds drop out, than career perspectives only. Probably junior and senior vocational education do not link up well with each other. It is also possible that students with a vocational training have better job opportunities than students qualified for secondary general education. Age is an indicator for the school career that preceded senior vocational education. Older students have probably once repeated a school year. These students seem less willing to invest in education.

References

Allison, P.D. (1984), *Event history analysis:Regression for longitudinal event data*. Beverly Hills: Sage publications.

Batenburg, Th.A. & Haanstra, F. (1992). *Instroom en rendement van het deeltijd-MBO*. Groningen: RION.

Blustein, D.L. (1988). A canonical analysis of career choice crystallization and vocational maturity. *Journal of Counseling Psychology*, Vol. 35, No 3, 294-297.

Blossfeld, H.P., Hamerle, A. & Mayer, K.U. (1989). *Event history analysis: Statistical theory and application in the social sciences*. New Jersey: Lawrence Erlbaum Associates.

Boer, P.R. & Meesterberends-Harms, G.J. (1992). *Het interne rendement van het leerlingwezen: een vooronderzoek*. Groningen: RION.

Bosker, R.J. (1990). *Extra kansen dankzij de school?: het differentieel effect van schoolkenmerken op loopbanen in het voortgezet onderwijs voor lager versus hoger milieu leerlingen en jongens versus meisjes*. Nijmegen: ITS.

CBS (1989). *Statistieken van het middelbaar beroepsonderwijs: scholen en leerlingen*. s'Gravenhage: SDU-uitgeverij.

Horn, W. (1969). *Prüfsystem für Schul- und Bildungsberatung. Handanweisung. Göttingen: Dr. C.J.Hogrete.*

Groothuis, H.J.J. & Mildert, J.C. van (1984). Push- en pullfactoren bij voortijdige schoolverlaters uit het MBO. In: C. van Calcar, T. Frieling & J. Mastik (red.). De school, een wissel tussen leven en werk; opstellen over voortijdige schoolverlaters. Lisse: Swets en Zeitlinger.

Kodde, D.A. (1985). *Micro-economic analysis of demand for education*. Dissertation.

Meijers, F. (1991). De betekenis van arbeid in het levensplan van jongen mannen en vrouwen. *Sociologische gids,5,308-323*.

Peetsma, T.T.D. (1992). Toekomst als motor. Amsterdam: SCO.

Peetsma, T.T.d. (1985). *Meting van toekomstperspectief bij leerlingen van mavo, havo en vwo*. Amsterdam: SCO.

Raad voor het Jeugdbeleid (1991). *Kiezen voor je toekomst; Advies over de begeleiding van het proces van studie- en beroepskeuze van jeugdigen*. Rijswijk: Ministerie van W.V.C.

Reenders, T. & Velden, L. van der (1984). *Voortijdig schoolverlaten in het middelbaar beroepsonderwijs; eindverslag van een onderzoek van de Projectgroep Onderwijs en Arbeidsmarkt*. Groningen: Sociologisch Instituut.

Reich, C. & Young, V. (1975). Patterns of dropping out. *Interchange*, Vol. 6, nr. 4.

Savickas, M.L., Silling, S.M. & Schwartz, S. (1984). Time perspective in vocational maturity and career decision making. *Journal of Vocational Behavior 25*, 258-269.

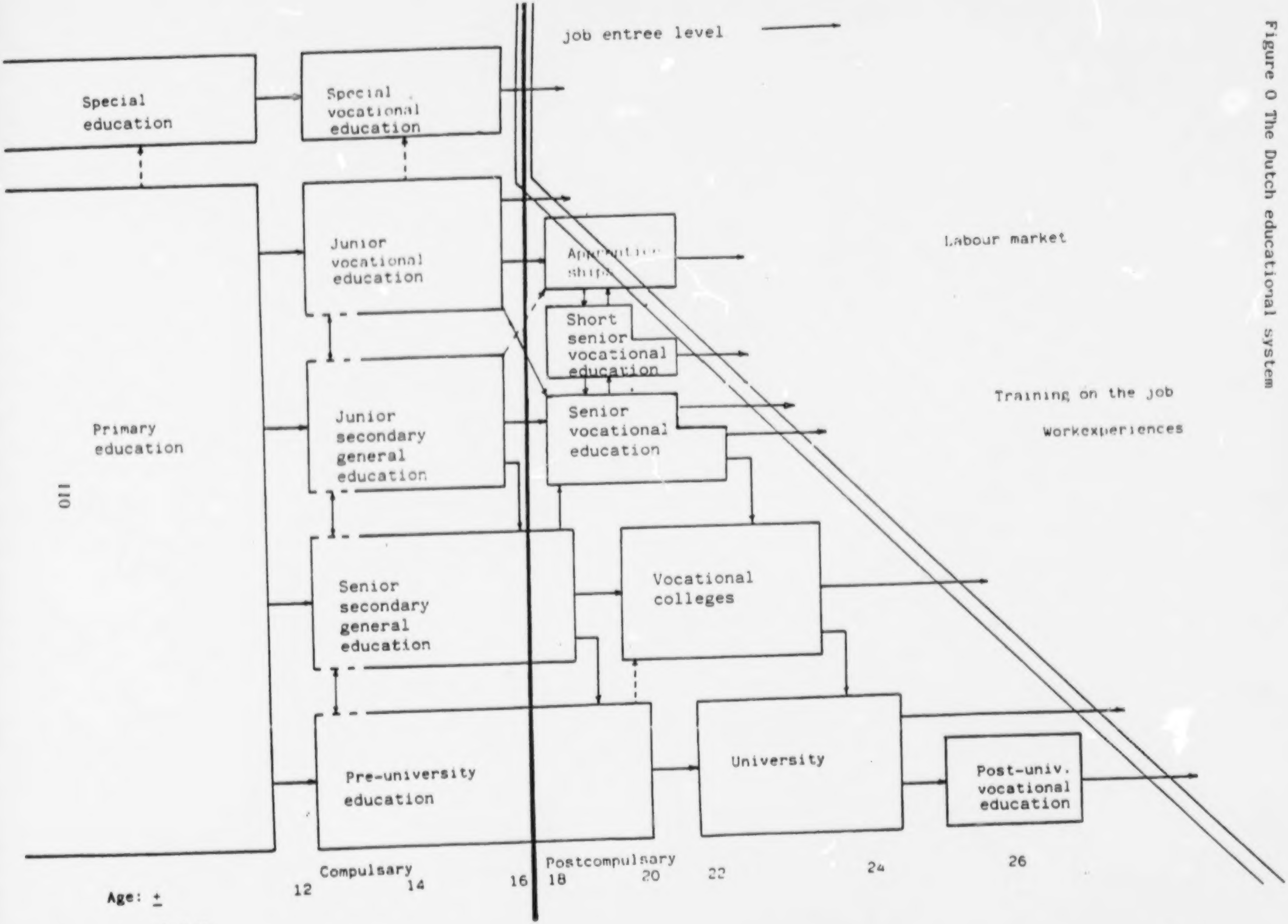
Stichting Vakonderwijs Drenthe (1982). *Tussentijdse schoolverlaters van het MBO; een verkennend en orienterend onderzoek: cursusjaar 1979-1980*. Door: Jager, H.B. & M.G. Verhoeven. Assen: SVO-Drenthe.

Tuma, N.B. & Hannan, M.T. (1984). *Social dynamics: Models and methods*. New York: Academic.

Willett, J.B. & Singer, J.D. (1991). From whether to when: New methods for studying student dropout and teacher attrition. *Review of educational research*, vol. 61, no 4, pp. 407-450.

Appendix 1

Figure 0 The Dutch educational system


job entree level
Special education
Special vocational education
Primary education
Junior vocational education
Apprenticeships
Short senior vocational education
Junior secondary general education
Senior vocational education
Senior secondary general education
Vocational colleges
Pre-university education
University
Post-univ. vocational education
Labour market
Training on the job
Workexperiences
Compulsary
Postcompulsary
Age: ±
12
14
16
18
20
22
24
26

REDIRECTING SECONDARY VOCATIONAL EDUCATION TOWARD THE 21ST CENTURY

Richard L. Lynch, Clifton L. Smith, and Jay W. Rojewski

Division of Adult Education and Occupational Studies
The University of Georgia

Paper prepared for presentation at the annual convention of the American Educational Research Association, Atlanta, GA, April 13, 1993.

REDIRECTING SECONDARY VOCATIONAL EDUCATION TOWARD THE 21ST CENTURY

If *A Nation at Risk* (National Commission on Excellence in Education, 1982) is seen as the seminal report for redirecting major reform in public education, especially secondary education, then the first decade of modern reform can be viewed primarily as one of toughening academic requirements for college-bound students. The national education goal throughout the 1980s was to prepare students for higher education. Over 30 reports followed *A Nation At Risk* and collectively they influenced individual states to raise high school graduation requirements--primarily in mathematics, science, social sciences, and languages--for college bound students.

Then, in 1988, the William T. Grant Foundation Commission on Work, Family, and Citizenship issued its report now popularized as the *Forgotten Half*. This report informed the nation that more than half of all American high school graduates do not graduate from college. Their data and analyses of information pointed out the inherent unfairness of the nation's relatively low resource allocation to noncollege-bound students. Paraphrased, the essential question posed in the Grant Foundation report is: What can adults and the public education system do to help young, noncollege bound students achieve the full blessings of their abilities and all they hope for in life?

The Grant Foundation report may have marked a turning point in the education reform movement. Two years later, the National Center on Education and the Economy (1990) published its now well quoted and documented report, *America's Choice: High Skills or Low Wages!* The essential conclusion in this document is that America must quickly face a choice of offering to all of its young people either high skills (*i.e.*, by fundamentally changing our approach to work and education) or low wages (*i.e.*, by essentially ignoring the 70% of students who do not benefit well from our current education system).

In between these two reports was the release of data and information from the National Assessment of Vocational Education (NAVE; 1989). NAVE's recommendations aimed directly at making vocational education part of the reform movement and encouraged reformers to improve the academic achievement of all students, not just those preparing to enter college. "Upgraded and invigorated vocational education could broaden and deepen what is meant by providing quality education for all students, and especially for those students who plan to work after high school"
(p. 85).

These documents have spawned additional reports which are now saying that schools should prepare students for the world of work and for college. Several of these reports seem to have much in common. Further, many states seem to be drawing heavily on the various reports as they posit new directions and propose revised programs for vocational education. It now seems appropriate to give this new phase of education reform some structure to facilitate identification of common themes, components, and recommendations.

Thus, the purpose of this paper is to categorize and classify themes, related components, and suggestions emanating from contemporary reports (*i.e.*, since 1988) that seem to undergird reform in secondary vocational education. The resulting matrix should be useful to facilitate reform and redirection of secondary vocational education at the state and local level, to establish a research agenda, and to facilitate program assessment.

METHODS

This review was undertaken, in part, to determine the current state of literature on recent educational reform as it relates to prior waves of educational reform and its impact on preparation for work (*inc.*, secondary and postsecondary vocational education) and noncollege-bound youth.

Literature Search Procedures

A first step in the document identification process involved locating references that dealt with educational reform at both national and state levels over the past five years. To accomplish this, a systematic review of relevant literature was undertaken. The primary source for locating documentation was through the ERIC database system. Researchers used a variety of search terms to identify appropriate documents. Examples of key search terms included secondary vocational education, technical education, educational reform, educational legislation, and educational planning.

A methodological, systematic approach to document selection was achieved through use of *a priori* criteria which served to delimit the scope of the literature search. Specific criteria included:

- Only contemporary national and state-level documents, published from 1988 to the present, were considered for inclusion.
- The literature review was limited to relatively well known national reports; that is, findings had to have been reported at national conferences, articles about the reports had to have been published in professional journals read by practitioners, and information from the reports had to have been cited in other documents or in conference presentations. The reports had to have professional credibility.
- Further, national reports had to have an expressly stated or implied purpose of focusing on noncollege- or career-bound students (*see Figure 1*).
- State-level reform literature had to be obtainable to a large audience. Thus, the ERIC database system was chosen as the primary outlet for the literature search. We realize that this excludes a number of documents that may have been produced and distributed on a limited basis by individual states dealing with educational reform. However, the focus here was on easily identifiable

and obtainable documentation (such as that afforded by the ERIC system). The rationale for this criteria was that researchers (as well as politicians, school boards, and the general citizenry) must be able to quickly and easily identify and obtain documents as they develop research agendas or specific studies. An exhaustive list and review of all state efforts in educational reform was not our goal.

- Documents that described state-level reform efforts were included only if the contents specifically targeted reform efforts in that state. These efforts might have been spurred by national debate or reform efforts but had to have direct bearing on state processes.
- Only those documents that dealt specifically--or contained sections that dealt specifically--with educational reform as it pertains to "workforce education" were included in the final analysis. This eliminated several state-level documents that dealt primarily with general or academic educational reform.
- The review and analysis were limited to secondary vocational education. It is recognized that several studies call for considerable reform in postsecondary, adult, and employer-based vocational and technical education as well. However, only themes and content germane to secondary vocational education have been included in this paper.

Using this criteria a total of six national reform documents were identified and included in the analysis. The purposes for each of these reports are presented in Figure 1. Further, education reform documents for 12 states were identified and included in the analysis.

Insert Figure 1 about here

Analysis of Literature

This paper sought to categorize and classify themes, components, and suggestions emanating from contemporary reports on education reform that pertained directly to secondary vocational education and workforce preparation. To accomplish this purpose, a theme (or content) analysis approach was adopted. Following identification of appropriate literature, all documents were analyzed using a content analysis approach, similar to the process described by Lynch, Schmidt, and Asche (1988) and Rojewski, Lynch, and Smith (1992). Basically, major elements from each document were identified including major recommendations for reform, intent of enacted legislation, and actual reform efforts related to vocational education being implemented. Analysis assumed a qualitative nature as similar issues or themes from all documents were categorized to form predominant categories.

An inductive coding scheme was used so that identified issues would drive and shape the theme analysis process rather than predisposed ideas or a priori categories.

Major themes or categories were not developed prior to the start of theme analysis. Individual elements reflecting national and state reform efforts that held similar ideas were grouped together and eventually classified by the common theme or issue that emerged. Agreement among authors was achieved for all group assignment and major theme identification. For those categories or theme placements where disagreement occurred, a discussion of alternate sides was presented until consensus was achieved.

Limitations

This effort does not represent an exhaustive nor comprehensive listing of current educational reform efforts at national or state levels. It is, in contrast, a purposive sampling of available documents that detail such reform movements as they relate directly to secondary vocational education. Thus, the parameters placed on this work by the *a priori* selection criteria must be recognized as findings are considered.

All documents were qualitatively reviewed and thus the interpretations and final themes/ categories which were derived are dependent on the perspectives of the three reviewers. Undoubtedly, if other reviewers were to engage in this activity, additional or different categories might be identified. Even so, we believe that this represents a solid base for further discussion and a beginning in laying out major themes and directions related to secondary vocational education reform for research on careers and work life.

RESULTS

The described review protocol resulted in identification of nine major reform themes. Each major category was, in turn, analyzed for critical components (*i.e.*, sub-themes) that collectively comprised the theme (*see Table 1*). Results for each theme are examined in the following pages.

Insert Table 1 about here.

Guaranteed Access to Education, Training, and Employment

Faced with the challenge of preparing youth for a future work world that requires more than mastery of basic reading, writing, and arithmetic, a high priority in most reform documents is the extension of education and training through substantive alliances. In most instances, alliances are proposed between educational levels (secondary to postsecondary) in which a continuity of education and training opportunities are jointly planned. Major emphasis areas within this theme include the development of tech-prep (2+2), joint secondary-postsecondary enrollment programs for secondary students, and flexibility on the part of both secondary and postsecondary educational systems to accommodate a variety of alternative paths to technical and professional competence.

Coalitions between schools and the business/industry community are also being stressed. Included within this connection are the sponsorship of school-to-work transition programs, the identification of employability skills that should be achieved by youth within the educational system, and on-going planning and collaboration on curriculum, equipment, technology, and materials. Rapid transition to industry-sponsored training programs and/or entry-level employment into good jobs for new high school graduates are also proposed in several national or state reports.

Meaningful Participation of All Students

Recommended reform in workforce education has reconfirmed a growing commitment that a quality high school education be extended to all youth including students with special learning needs and those from diverse cultural backgrounds. A high priority in most reform documents is a stated assurance of providing equal access and opportunities for participation in employment preparation programs. Aggressive and continuous outreach and recruitment efforts were identified as priorities to inform students that appropriate programs were available and to assure publicly their acceptance into such programs. Several reports explicitly identified barriers--gender-related, physical, prejudicial, or psychological--that were to be removed to make programs and classrooms accessible to all students.

Reform documents heavily cited the use of flexible and alternative service delivery systems to support meaningful involvement in workforce development programs including vocational education. For example, two specific alternative delivery systems include an "after hours" program for working students (evenings or weekends) and alternative learning centers.

Many educational reformers have adopted a longitudinal approach toward flexible and alternative service delivery for students with special needs. First, the provision of early intervention programs for disadvantaged youth (*e.g*,. Head Start) are advocated for establishing a foundation for later learning. Secondly, dropout recovery and prevention programs are necessary to ensure that all youth have opportunities to complete a secondary education that combines both academic education and workforce preparation.

Nearly all documents examine the needs of the whole student rather than school-only needs. Provision of support services are critical for some students to ensure optimal chances for success in all aspects of life. Examples of support services are remedial classes, English as a second language, mentorship programs, crisis intervention services, day care for children of teenage parents, transportation services, and financial aid packages for economically disadvantaged youth.

Early Orientation to Work

Several reform documents highlighted the importance of providing longitudinal, sequential, and progressive career development and work-oriented activities for all students. Middle school programs (grades 6-8) would focus primarily on coursework that provide students with an understanding of the workplace, employability skills, use of advanced technologies in the workplace, and instruction on family life skills (*e.g.*, parenting).

As students enter high school, the emphasis of career development programming and interventions would shift with the aid of improved career counseling and guidance. Assistance in making tentative career choices would be based on formal assessment (career interest and aptitude assessment) starting at or around the 8th grade. Career guidance would be an essential element of every student's program and would provide activities designed to further clarify potential career options. Individualized career plans--and related academic planning--would be developed for every student and updated, as necessary, on an annual basis.

Integrated Theoretical and Practical Knowledge (Academics and Vocational)

Nearly all documents reviewed for this paper identified the integration of academic (theory) and vocational education (practice) as critical to the reform of secondary vocational programs. This represents a crucial shift in the focus of vocational education. Nearly all documents called for new or revised courses and programs that are "rigorous," "challenging," "with high standards," and "technologically up-to-date."

Modified vocational curriculum should reflect an emphasis on contextual learning; authentic work-based problems that allow application of academic coursework in "real-world" settings; and, rigorous, high-level, work-based, applied academic programs. These programs should be developed around broad career clusters to further solidify the connection between school and work.

Along with the redesign of curriculum are recommended changes in student outcomes. Challenging student outcomes must be developed to compliment suggested curriculum changes. Examples of these outcomes include establishment of job specific and transferable skills; an emphasis on ensuring all students attain fundamental academic skills and practical problem-solving skills; advanced technologies; and employability skills, including leadership.

To support proposed changes in curriculum and student outcomes, a number of innovative instructional reform measures were suggested. These approaches should be diverse and capitalize on our current understanding of thinking and learning. Several of these techniques are the use of hands-on demonstrations and activities, video and multimedia technologies, interactive methods, contextual-based learning, and other means of actively engaging students in the learning process.

Employers, Employee Organizations, and Community and Social Services Must Assume Responsibilities for the Development of Youth Employment Skills

There are many forms and strategies that address youth employment skills, but most call for an arrangement where the school, business, and local community collectively plan, organize, and develop a system of employment preparation. Such a system must include parental participation and the use of social services where appropriate. In addition, some states have revised employment laws to allow for a variety of work-related experiences for youths, as well as initial employment guarantees for graduates of secondary and postsecondary educational systems.

New strategies are called for to help youth acquire the skills most will need in the workplace of the future. A concept discussed in all national and most state reports was the use of apprenticeship programs to prepare young people for the workplace. Any youth apprenticeship system would have close integration of academic/vocational learning and school and workplace experiences.

Other proposed school-to-work transition models include high quality cooperative education programs, use of secondary school academy programs (schools-within-schools or focused schools), and priority placement in industry-sponsored training programs upon graduation. In addition, many reports advocate mandatory or available programs in community service.

Each of the school-to-work transition models advocated that both the workplace and community be used as learning environments; work experience and academic learning be linked; youth be given a variety of roles and responsibilities; and that youth have a mentor relationship with adult workers. Programs could be offered by many different kinds of educational, community, and/or service institutions teamed up with employers prepared to assist with the job-site component of the program.

Student Assessment

Concern over the quality of education and the ability of students to meet the demand of a changing workplace has brought about an emphasis that all students complete a structured, highly focused, and challenging program of study. States are developing comprehensive models that focus on helping students maximize their own potential through continuous improvement of diagnostic and assessment techniques, curriculum redesign, and systematic evaluation.

As part of the reform movement, policy-makers are mandating that education be measured on objectively stated results. Even though reformers are calling for standardized tests to measure student achievement, many believe that these tests do not accurately measure the advanced skills and knowledge needed by the workforce of the future. Learning is best shown by students' performance, applying information and skills to real-life challenges; thus, a number of reform measures in alternative student performance assessment are in the early stages of development. "Authentic" evaluation of students, including performance-testing, assessment of student projects, on the job assessments, and the use of portfolios, as well as student self-evaluation are among proposed alternative assessment techniques.

Recently, some states have moved forward with the development of a system to award students with a Certificate of Initial Mastery (CIM) upon completion of a predetermined level of competence in basic skills. Some CIM assessment systems are based on portfolio development where students periodically demonstrate performance in specific outcome areas. Assessment is viewed in a cumulative or longitudinal fashion over the K-10 period.

Policy Directive and Guidance

All reviewed documents call for a variety of policy-related reforms within public education. Major issues included school incentives, organization of curriculum, management of schools, performance standards for students and schools, coordination of services, and research on program effectiveness and best practices.

All national reports proposed establishing national or world class standards and a national standards board. As envisioned by policy makers, an examination system would set a high standard of mastery for what a student is expected to know and be able to do, and permit students to take performance exams whenever, and as often as needed, until reaching a required level of mastery. Such a system would produce more variation in the curriculum and in teaching methods as a part of the school restructuring process, since time would not be the measure for awarding a diploma.

Research is called for in assessing the development and implementation of reform initiatives being implemented in the states. This type of research should be designed to measure the success as well as the shortcomings of separate initiatives and to assist in the constant improvement of student preparation for employment for the 21st century.

Improved Teacher Training and Staff Development

Many reform initiatives identified the need to invest heavily in teacher training and staff development with the ultimate goal of developing a high quality teaching corps. Recommendations strongly urged the provision of adequate instructional resources (*e.g.*, textbooks, computers, multimedia materials). Several reports called for some level of redesign in current teacher training programs. A number of specific areas were identified for consideration including new pedagogical skills, team teaching, instructional management skills and technologies, and principles of workplace restructuring. A critical need to promote academic competencies of vocational teachers and students through applied academic programs was stressed.

Strengthening and expanding current staff development efforts is another component of improving professional expertise. Here, a suggestion was made that academic and vocational teachers be given the time to work together to jointly develop and teach applied academic/vocational programs. An innovative proposal by one state (Ohio) recommended that all educators develop an annual Individualized Professional Development Plan to ensure appropriate career growth tailored to educators' needs.

DISCUSSION

In reading through the six national and 12 state reports and then qualitatively analyzing emergent themes, the authors were struck with some occasionally subtle--

but seemingly important--assumptions and apparent conclusions appearing in these documents. These "assumptions" (for lack of a better word) seem to underlay the philosophy or basic beliefs of the people who participated in the development and writing of the reform documents analyzed in this paper. Sometimes they are obviously stated, sometimes a bit more subtle. These assumptions are briefly discussed here to facilitate discussion, research, and assessment among the profession.

(a) All students have capacity to learn given the resources, time, and use of appropriate instructional strategies. Seemingly, the reports are asking that the public make a serious and meaningful commitment (not just lip service) to the education of all students.

(b) Many essential and well rewarded occupations do not require college-level (*i.e.*, baccalaureate and postbaccalaureate) education, but they do require a much higher quality of education than that typically provided to a majority of students in public schools. The general public and public policy ought to give just as serious of attention to high quality secondary vocational and postsecondary technical education as it does to college education.

(c) Closely related, effective forms of education and training can and do occur in non-collegiate and other non-school settings. There is strong support in the reports for granting schooling credentials for apprenticeship and other work-based education programs. Meaningful school-business partnerships and involvement in education from the broader community were strongly stressed in the reports.

(d) Although challenging to existing structure, "rules," turfs, and funding mechanisms, educational opportunities ought to be seamless. There seems to be an assumption that secondary and postsecondary institutions (including colleges and universities) can and will work together to create flexible, alternative education delivery systems for students.

(e) Effective learning is closely related to successful performance in the workplace and that academic teachers (*i.e.*, those in science, mathematics, language arts, social sciences) can and will accommodate work-based, contextual learning. This also has underpinnings for the preservice and inservice education of teachers.

(f) Schools can transform themselves into new models ("high performance organizations") that will develop prerequisite skills and competencies of all students. Further, school leaders (superintendents, principals, teachers) and community leaders and agencies (school boards, social services) commit to reform, are capable of leading it, can create an organizational climate to bring it about, and will make financial commitments to it.

(g) Establishing "world class standards" and then engaging in further and possibly different forms of student assessment will result in improved student performance, better preparation for jobs of the 21st century, and better assurance that students are ready for the world of work and the realities of adult life. Further, developing world class standards will enable America to

compete internationally through a high quality workforce. National reports particularly are very strong on developing national standards and assessment techniques and using these data for international comparisons.

(h) Teachers are integral to the successful preparation of students for the workplace and the adult world. Teacher education will need to be redesigned and staff development for inservice teachers will need to be improved to bring about the changes envisioned in a reformed secondary vocational education.

REFERENCES/BIBLIOGRAPHY

Arkansas Department of Education. (1992). The Arkansas plan for tech prep - 2+4+2+2. Little Rock, AR: Vocational and Technical Education Division.

Bottoms, G., Presson, A., & Johnson, M. (1992). Making high schools work. Atlanta, GA: Southern Regional Education Board.

Brogan, B. R. (1991). School reform in Wisconsin: Recommendations of the Commission on Schools for the 21st Century. Madison: University of Wisconsin, Institute of Public Affairs.

Collins, T. (1991, August). Reform and reaction: The political economy of education in Kentucky. Paper presented at the Annual Meeting of the Rural Sociological Society, Columbus, OH. (ERIC Document Reproduction Service No. ED 340 540)

Consortium on Educational Policy Studies. (1990, August). States of education in Indiana: An overview. Bloomington: Indiana University, Author. (ERIC Document Reproduction Service No. ED 323 667)

Council of Chief State School Officers (CCSSO). (1991). Connecting school and employment (Policy Statement). Washington, DC: Author.

Engel, J., Rieneke, J., & Myton, D. V. (1992, April). Oregon education act /for the 21st century: Implications for the profession and administrator training. Paper presented at the Annual Meeting of the American Education Research Association, San Francisco, CA. (ERIC Document Reproduction Service No. ED 347 681)

Fletcher, G., & Trapnell, G. (1993). Executive summary: Creating the vision for secondary vocational education in the 21st century. Atlanta: Georgia Council on Vocational Education.

Lynch, R. L., Schmidt, B. J., & Asche, F. M. (1988). Determining priorities for vocational education research through use of the nominal group technique. Journal of Vocational and Technical Education, 5(1), 13-27.

National Assessment of Vocational Education. (1989). Final Report (Vol I). Summary of Findings and Recommendations. Washington, DC: U.S. Department of Education.

National Center on Education and the Economy. (1990). America's choice: High skills or low wages! (Report of the Commission on the Skills of the American Workforce). Rochester, NY: Author.

National Commission on Excellence in Education. (1983). A nation at risk. The imperative for educational reform. Washington, DC: U.S. Government Printing Office.

Merickel, M. L. (1992). Overview of economic and educational reform in the state of Oregon. Corvallis: Oregon State University, Department of Professional Technical Education.

New York State of Education. (1992). Federal legislation and education in New York state. Albany: The University of New York, Author. (ERIC Document Reproduction Service No. ED 343 271)

Ohio Department of Education. (1990, June). Ohio's future at work: Action plan for accelerating the modernization of vocational education in Ohio. Columbus, OH: Division of Vocational and Career Education.

Rojewski, J. W., Lynch, R. L., & Smith, C. S. (1992). Preparation for employment in Georgia toward the 21st century: Developing a vision for secondary vocational education. Journal of Vocational Education Research, 17(4), 1-25.

Samson, H. E. (1990). Strategies for change in Wisconsin K-12 vocational education. Madison: University of Wisconsin, Department of Continuing and Vocational Education.

Secretary's Commission on Achieving Necessary Skills. (1992). Learning a living: A blueprint for high performance (A SCANS report for America 2000). Washington, DC: U.S. Department of Labor, Author.

William T. Grant Foundation Commission on Work, Family, and Citizenship. (1988). The forgotten half: Pathways to success for America's youth and young families. Washington, DC: Author.

Council of Chief State School Officers (1991)	Improve education and experience that bridge youth and adulthood and prepare youth for immediate or eventual careers after high school.
National Assessment of Vocational Education (NAVE; 1989)	Summarize the main findings and conclusions of the National Assessment of Vocational Education as mandated by Congress in the Carl D. Perkins Act of 1984 (Section 403[a]) and to propose recommendations for federal policy on vocational education.
National Center on Education and the Economy (1990)	Provide the framework for developing a high quality American education and training system, closely linked to high performance work organizations.
Secretary's Commission on Achieving Necessary Skills (SCANS; 1992)	The final report of the SCANS Commission summarizes what must be done to build high performance workplaces and schools and describes how to prepare young people, as well as those workers on the job, for productive work in the 21st century.
Southern Regional Education Board (1992)	Share information about successful ways to improve the high school experience and achievement of career-bound students.
William T. Grant Foundation (1988)	Recommend concrete actions -the pathways to success- to communities, families, employers, and governments to enhance successful adolescent transition to adulthood with a particular focus to assure that members of the *Forgotten Half* join the "remembered half" in enjoying the benefits of the America they have helped to create.

Figure 1

Purposes of Contemporary National Reports Pertinent to Reform in Secondary Vocational Education

Table 1

Major Reform Themes and Subthemes in Secondary Vocational Education

Themes	National Reports 1	2	3	4	5	6	State Reports
Guaranteed Access to Postsecondary Education, Training, and Employment Through Substantive Education Alliances							
Tech-Prep Programs	X			X			GA, IN, MD, OR, WI
Secondary/Postsecondary Institution Linkages	X	X	X	X		X	OH, WI
School and Business/Industry Linkages	X	X		X		X	IN, OH, NC
Allow for Meaningful Participation of All Youth until Mastery							
Equal Access and Opportunities	X	X	X	X		X	OH, NY
Early Intervention Programs for Disadvantaged Youth	X		X			X	GA, IN, KY, NY, OR
Flexible/Alternative Delivery Systems	X	X	X	X	X	X	GA, KY, NY, OH, OR
Dropout Prevention and Recovery				X	X	X	GA, IN, MD, NY, OH, OR
Significant Support Services and Funding	X	X	X	X	X	X	GA, KY, NY, OH, OR
Aggressive Outreach and Recruitment	X	X				X	OH

Table 1 (continued)

Themes	**National Reports**						**State Reports**
	1	2	3	4	5	6	
Early Orientation to Work and Family Life							
Career Exploration/Development Activities	X	X		X	X		AR, GA, NC, NY, OH
Middle School Programs	X	X			X		GA, MD, OH
Improved Career Guidance and Counseling	X	X				X	AR, NC, NY, OH
Family Life Education						X	
Integrated Theoretical and Practical Knowledge (Academic and Vocational; Rigorous)							
Curriculum Redesign	X	X	X		X	X	GA, KY, NY, OH, OR, PA, WI
Focus on Broad Career Clusters	X	X	X				GA, KY, NC, NY, OH, OR
Explicit, Challenging Student Outcomes	X	X	X		X		GA, NY, OH, OR, WI
Contextual-Based Instructional Strategies	X	X			X	X	GA, IN, OH, OR, WI
Diverse, Multi-approach to Instruction	X	X			X		GA, KY, NY

Table 1 (continued)

Themes	National Reports						State Reports
	1	2	3	4	5	6	
Employers, Employee Organizations, and Community and Social Services Must Assume Responsibilities for the Development of Youth Employment Skills							
Business-Education Partnerships	X	X	X	X	X	X	IN, MD, OR, WI
School-to-Work Transition Programs–Good Jobs	X	X	X			X	AR, GA, IN, MD, NC, NY, OH, OR
Apprenticeship and Other On-the-Job Training Models	X	X	X	X	X	X	AR. GA, MD, NY, OR, PA
Community Service		X				X	GA, KY, MD, PA
Parent Participation	X					X	
Social Service Assistance				X		X	KY, NY, OH
Student Assessment							
Model: Diagnosis, Assessment, Program of Study, Evaluation	X				X	X	AR, GA, MD
Credentials or Certificate of Student Mastery	X	X		X	X		GA, IN, MD, OR, WI
Credentials or Certificate of Occupational Skills	X	X		X			OR
Alternative Assessment Techniques	X	X	X	X		X	GA, IN, KY, OH, OR

Table 1 (continued)

Themes	National Reports						State Reports
	1	2	3	4	5	6	
Policy Directives and Guidance							
Incentives to Improve Employment Readiness		X			X	X	KY
World Class Standards and Assessment	X	X	X	X	X	X	GA, IN, NY, WI
Coordination of Education, Health, Training and Human Services		X				X	NY
School Restructuring		X			X	X	AR, GA, IN, KY, NC, NY, OR
Research, Data on Effectiveness and Best Practices, Experimentation		X	X	X	X	X	IN, KY, NY
Improved Teacher Training and Staff Development							
Enhance (or Redesign) Preservice Teacher Education	X		X			X	GA, OR, WI
Strengthen Inservice Teacher and Staff Development	X	X	X		X	X	GA, OH
Resources/Funding	X						GA, OH

1 = Southern Region Educational Board
2 = Council of Chief State School Officers
3 = National Assessment of Vocational Education
4 = National Commision on Excellence in Education
5 = SCANS (Secretary's Commision on Achieving Necessary Skills)
6 = William T. Grant Foundation Commission

The Impact of Vocational Training and Employment during Secondary School on Postsecondary Outcomes of SED Graduates

Rozanne McCall, Dorothy Burns, & Naomi Zigmond
University of Pittsburgh

* The research reported herein was supported by a research grant (H023C00054) from the U.S. Department of Education / Office of Special Education Programs. Opinions expressed in this paper are those of the authors. Not for reproduction.

Abstract

Substantial numbers of special education students do not fare well after high school. Research findings indicate that technical training or competitive employment during high school years may significantly impact postsecondary employment outcomes. The purpose of this study was to examine the vocational education and community-based employment experiences of 42 secondary students with serious emotional disturbances (SED) served in public and approved private high schools to determine which were related to postsecondary employment. Community-based employment experiences of these students, interviewed at 6 and 18 months past graduation, rather than secondary vocational coursework or work study, were related to work status.

The Impact of Vocational Training and Employment during Secondary School on Postsecondary Outcomes of SED Graduates

Rozanne McCall, Dorothy Burns & Naomi Zigmond

With the passage of The Vocational Education Act of 1963, national attention was drawn to the need to enhance the marketable skills of youth with disabilities. This Act and the subsequent amendments of 1968 and 1976 led to the increased participation of youth with disabilities in high school vocational education programs. And, in 1983, The Amendments to the Education of the Handicapped Act of 1973 (EHA P.L. 98-199) authorized the Office of Special Education and Rehabilitation to fund contracts and grants to improve education and training and to coordinate needed services to assist students with disabilities in making the transition from high school to postsecondary education and employment. A year later, The Carl D. Perkins Vocational Education Act expanded the mandate by defining the nature and extent of vocational training assessment, counseling, and support services to be made available to disadvantaged students and students with disabilities (Rusch and Phelps, 1984).

Despite this legislative foundation, research findings have revealed that a substantial number of these young people with disabilities are not accessing comprehensive vocational education and are exiting secondary school ill-prepared to either enter the workplace or obtain the postsecondary education required for technological positions. According to the National Longitudinal Transition Study (NLTS) of all youth with disabilities who were out of secondary school more than one year, only 29.2% had full time positions and another 17.2% were employed part time. Few (14.6%) had engaged in any kind of postsecondary training to improve their prospects for employment (Eleventh Annual Report, 1989, pp. 80-83).

The plight of youth with serious emotional disturbances (SED), whose dropout rate hovers around 41%, is particularly distressing. Both those who leave school prematurely and those who graduate appear to lack the basic skills, higher order thinking skills, and technological training required by employers. According to the National Longitudinal Transition Study, among SED youth who had been out of secondary school more than one year, only 21.5% had found part-time work and fewer yet (18.5%) were employed full-time. Of the 11.7% who had enrolled in postsecondary education, 8.8% were in vocational/technical schools, 4.1% in a 2-year college and 1.3% in a 4-year college (Eleventh Annual Report, 1989). Prospects for economic self-sufficiency for this population seem grim indeed since The National

Commission on Children (1991) projects that by the end of the century more than 50% of all new positions will require some kind of postsecondary education and approximately 33% will require a college degree. For youth diagnosed as SED, "wheels and a place of my own" seem likely to remain illusive goals.

Neel, Meadows, Levine and Edgar (1988) also examined the postsecondary adjustment of students with behavioral disorders (a subsample of students with SED) who graduated from high school. Only 17% of the group were enrolled in a school program in contrast to 47% of a nonhandicapped cohort; most youth with behavioral disorders simply did not see postsecondary education or training as a resource. Furthermore, the nonhandicapped youth were going to school AND working part-time, whereas youth with behavioral disorders were both not working and not in school, and unemployed at nearly 1.5 the rate as the non-handicapped group (40% vs 27%).

A deficiency in marketable skills and postsecondary training is not the only barrier to employment faced by students with SED. They frequently lack the social skills prerequisite to obtaining and keeping a job. Bullis and Gaylord-Ross (1991) suggest that behavioral strategies which enable youth to manage and suppress disruptive behavior at work must be taught "because ... the presence of antisocial behavior and the absence of positive social skills make the typical student with behavioral disorders...a poor candidate for job placement and retention" (p. vii). Thus, students with SED often face the future with three strikes against them: fewer basic skills than are needed for Workforce 2000; little, if any, schooling beyond high school; and few "employer pleasing skills" that help you get and keep a job.

Research findings (Wagner, 1992) indicate that while the years immediately following high school are crucial in establishing careers, floundering in the general population is not atypical during this important period. Youth frequently hop from one position--often a part-time unskilled job at low wages and no benefits--to another. Youth with disabilities may also experience job instability immediately following high school, although there are no data to date to indicate whether their lack of job-related skills and training set them on a failure trajectory.

Data from the NLTS (Wagner, 1992) indicate that competitive employment rates for youth with disabilities increased 11% from the first data collection period, 2 years or less out of school, to the second point of data collection, 3 to 5 years out of high school. Furthermore, in large part due to an increase in the minimum wage, 3 to 5 years after high school significantly fewer youth with serious emotional disturbances were making $4.30 or less per hour and significantly more were earning $6.00 or more per hour. However, $6.00/hour for full-time work only translates into an annual income of $12,480 before deductions. And only 18.5% of SED youth were full-time workers. In addition, while nearly 76% of the SED youth in the NLTS sample had been employed at some point since leaving high school and 72.7% were employed in the 12 months prior to being interviewed, only 48% had a job at the time of the interview. These figures contrast sharply with the data for those identified as learning disabled--95.2% employed at some point, 84.9% employed in the prior 12 months, and 71.5% employed at the time of the interview--indicating considerable less job stability for SED youth (Wagner, 1992, p. 4-16).

Data from a follow-up study by Edgar and Levine (1987) tell a similar story of floundering among SED young adults; 52% were employed 6 months following graduation but only 22% had jobs 6-30 months after exiting. Wagner (1992) suggests that floundering, as evidenced by prolonged early joblessness, results in lost opportunities for gaining valuable employment experience, putting youth at further disadvantage in the competition for choice entry-level jobs. Access to early employment enables young adults to "hone their work skills, develop their work attitudes and behaviors, and demonstrate their capabilities to sometimes skeptical employers" (Wagner, 1991, p. 4-2).

In trying to understand factors which might prepare youth with disabilities for the workplace, researchers have focused on the value of vocational education. However, Farding, Algozzine, Schwartz, Hensel, and Westling (1985) reported that, in spite of increased emphasis on vocational education, students with mild handicaps receive little vocational training, and that amount of vocational coursework is unrelated to post-high school adjustment. Rumberger and Daymont (1984) also reported that high school curricula had little effect on employment opportunities for those who did not enter college, since most of these youth entered low-skill jobs. But employment outcomes may differ among those who take only a few _unrelated_ vocational courses during high school and those who complete a comprehensive program that targets a specific skill. Thornton (1988) found that concentrated vocational training in a specific job-related program (such as office occupations) yielded more pay-off in the labor market than did training in several unrelated vocational areas.

Other researchers have focused not on the high school curriculum but on employment while in high school, either during the school year or in the summer, and postsecondary employment outcomes. Hasazi, Gordon, and Roe (1985) reported that 70% of students with disabilities who experienced paid employment during high school had obtained postsecondary positions, but of those with no secondary work experience only 41% were working. Summer employment also yielded payoffs after graduation, since students who had held part-time summer jobs while in high school generally enjoyed higher wages in their postsecondary positions. Rusch and Phelps (1987) cited lack of comprehensive work experience while in high school as one of the factors hindering postsecondary employment of special education students. But in none of these studies have students with SED been the focus of the investigation.

The purpose of this research was to examine the vocational preparation and community-based employment experiences during four years of high school of secondary students with serious emotional disturbances to determine which were related to productive postsecondary engagement.

DATA SOURCES

Sample. Forty-two graduates who had been served in high school as SED and were in grades 11 and 12 at the beginning of the study participated in this research. Thirty-seven were in approved private schools* and five attended public high schools. In this group of 29 males and 13 females, 34 were white. The average age at which students in the sample had been identified as in need of special education services was 11.1 years and as SED was 11.4 years. At the time of initial identification, 76% had been classified as seriously emotionally disturbed, but another 4% had been classified as learning disabled, 4% as educable mentally retarded, 12% as attention deficit disordered, and 4% as developmentally delayed. Achievement test scores during secondary school, in both reading and mathematics, were significantly below grade level for most students. The Cole Directory, which contains the wealth index of county residents, revealed that the socioeconomic status of the families of these graduates was fairly evenly distributed from high to low. Average age at graduation for the sample was 18.5 years.

---

* a separate day school placement for a student with a disability supported by public funds

High School Data Collection. Data collection forms were developed to permit recording of student demographic information, achievement data, the number and type of job-related vocational classes taken and grades earned, and the number, length of time, and type of work study opportunities afforded the student during high school. An interview protocol was also devised to glean information on student perceptions of school-based vocational preparation and community-based school year and summer employment. Employment data collected from each job experience included: site, job tasks, length of employment, hours per week, benefits and wages, how job was obtained, job satisfaction, and the reason employment was terminated (if applicable).

Postsecondary Data Collection. Information regarding the extent and nature of students' postsecondary productive engagement (employment, vocational training and postsecondary schooling) was obtained through telephone interviews with students at 6 months and at 18 months after graduation. The staff member who interviewed the youth as a high school student also conducted the youth's postsecondary interviews. Employment data collected in the follow-up interviews were the same as those collected at the secondary level. Postsecondary schooling information included the type of institution attended (technical school, 2-year college, etc.), length of time enrolled, part-time or full-time status, major or specialty, and the date and reason left (if applicable).

Procedure

A description of the study and consent forms were sent to parents/guardians of all secondary students with serious emotional disturbances in the participating schools. Upon obtaining parental consent, demographic data were taken from school records. Achievement data, the number, length of time, and type of work study opportunities, as well as the number of job-related vocational classes and grades earned were obtained both retrospectively and prospectively until the youth graduated, giving a fairly complete picture of the students' school-based vocational experience.

Researchers first met students while they were in high school when they consented to be interviewed once a year until graduation and at 6 and 18 months after graduation. Individual interviews lasted approximately one class period (45 minutes) and were conducted in a setting which ensured privacy. Students were advised of the confidential nature of the exchange and told that they need not respond to questions which made them uncomfortable; very few took advantage of this option. These structured "conversations" focused on students' perceptions of their schooling, especially their vocational preparation, and of their community-based employment experiences during the four years they were in high school.

RESULTS

High School Vocational Preparation

Coursework and Work Study. Table 1 summarizes students' vocational preparation during high school. School records of students' secondary vocational preparation indicated that 88% of the 42 students had taken a career education class which focused on career options and job acquisition skills. The number of skill-centered classes in which students had enrolled ranged from 1 to 11 with an average of 3.6 such classes during four years of high school. The number of students' work-study experiences ranged from 0-5 with a mean of 1.02; these work-study experiences were held for an average of 19.8 weeks, but the variance was considerable. Most work-study was school-based in positions such as teacher's aide or as office or maintenance assistants.

Competitive School Year Employment. Records indicated considerable variability in school year employment. Students averaged 1.3 community-based jobs over four years of high school (S.D.=1.57), working an average of 33.5 weeks (S.D.=36.45), for about 13 hours per week (S.D.=11.72). Each job was held for an average of 17.2 weeks (S.D.=16.23). The large variability is accounted for, in part, by the fact that only 28 of the 42 students held competitive employment while in high school.

Competititve Summer Employment. Students averaged 1.2 summer jobs (S.D.=1.41), working approximately 13 weeks (S.D.=14.27) across 4 summers, and averaging 14 hours per week (S.D.=14.8). The mean number of weeks per summer job was 6.3 weeks (S.D.=6.06). Twenty-four of the 42 students held at least one summer job while in high school.

Postsecondary Status

Telephone interviews were conducted with students at 6 months and at 18 months after graduation by the staff member who had interviewed them during their secondary school years. Interviewers asked the youth to reflect on their secondary vocational preparation and to discuss the extent and nature of their postsecondary employment and schooling experiences.

Status at Six Months Past Graduation. Forty-one young adults were interviewed at 6 months after graduation. Based on the nature of their postsecondary engagement, we divided youth into four groups: Working Only (Group 1), Working and in School (Group 2), In School Only (Group 3), and Not Engaged (Group 4). Table 2 shows that the sample was fairly evenly divided among the 4 groups at the time of the 6-month interview. Ten youth (24.3%) were working only, 12 (29.3%) each were either working and in school or in school only, and 7 (17.1%) were not engaged. Of the 22 youth (54.4%) who were working or working and going to school at 6 months, 64% were working part-time and 36% were working full-time. Forty-five percent of those employed were in restaurants, nearly 14% in sales, 9% each in assembly lines and as stock boys with the remaining in a wide variety of entry level positions.

Status at 18 Months Past Graduation. Sixteen youth were available for interviews at 18 months past graduation; the remainder of the sample had not been out of school long enough to be eligible for an 18-month interview. Of the 16 youth, 37.5% were engaged in both school and work (Table 3) up from 29.3% at 6 months following graduation. Slightly fewer were working only (12.5% vs. 24.3% at 6 months), but slightly more were in school only (31.2% vs. 29.3%). About the same number were not engaged. Of the 50% employed at 18 months, half were in full-time and half were in part-time jobs. Nearly 63% were working in restaurants while others were engaged in diverse positions. Only one youth appeared to be on a career path: This young man completed training in carpentry (his high school goal) at a technical school 12 months following high school graduation and had found full-time employment as a carpenter.

Stability of Postsecondary Engagement. Because of our primary interest in employment outcomes, youth were divided into 3 groups on the basis of their status at the time of the 6-and 18-month interviews: At work (Group 1), In school only (Group 2), and Not engaged (Group 3). Youth were classified as working if they were competitively employed part-time or full-time, or in military service. If the youth was working and attending school, he or she was classified as working. Students were classified as in school if they were engaged part-time or full-time in specific job training, technical school, skill training, or 2-year/4-year college. Those who were classified as not engaged were hospitalized or pursuing only informal leisure activities; there were no homemakers nor youth involved in volunteer work in our sample.

Between 6 and 18 months following graduation, productive engagement (at work or in school) appeared to remain fairly stable. An examination of type of activity (at work, in school, not engaged) at the two interview times also revealed stability within activity (Table 4). For example, 54% were working at 6 months past graduation with only slightly fewer (50%) working at 18 months; 29% and 31% were engaged in schooling only at 6 and 18 months past graduation. At 6 months, 29% of the employed youth were also in school and, at 18 months following high school, the percent had increased to 38% engaged in both school and work.

The number of changes from one activity to another provided further evidence of stability. At 18 months past graduation, most youth (9 of the 16 youth interviewed) had not changed their status (at work, school only, not engaged) from what it had been at 6 months, 3 had changed status once, (ie., school only to work or work to school only) and 3 had changed status twice. Only one youth had made more than two changes in type of activity.

To determine if the appearance of relative stability for this group of graduates belied individual floundering, the number of jobs held and schools attended were examined for each person up to 18 months past graduation (Table 5). Twelve of the 16 youth interviewed at 18-months had been employed at some point since leaving high school. Of these, 33.3% had had one job, 41.7% had held two jobs and 25% had had 3 different jobs--all lateral moves into entry level positions. Some had changed jobs before the 6-month interview, but nearly 54% had changed positions between their 6 and 18 month interview. In contrast, the number of schools attended indicated greater stability. Eleven students had enrolled in school, but nearly 73% had enrolled in only one school since leaving high school; 27.3% had attended two schools. The three students who had changed schools had all completed training at the prior institution.

Relationship Between High School Experience and Employment Status. ANOVAs were used to explore whether individuals in these three groups had participated differentially in secondary vocational preparation, or in community-based school year and summer employment.

High School Vocational Preparation. Secondary vocational preparation, including the number of vocational classes, number of work study experiences, and the number of weeks in those positions were examined across the three status groups. The extent or nature of secondary vocational classes (which ranged from one introductory level course to more than four in job-related preparation) failed to differentiate the groups. The number of school-based work-study jobs and the number of weeks in those jobs also failed to significantly differentiate among the three groups of SED high school graduates (Table 6).

Competitive School Year Employment. Working in community-based employment was related to both 6-and 18-month working status. The number of hours worked per week in competitive employment during the school year was significantly higher for employed youth at 6-months compared to youth engaged in schooling (Fisher PLSD=8.2, df=33, p<.05); (Table 7). Workers at 6-months averaged almost 16 hours of work per week during their secondary school years compared to only 6 hours per week for those not working but in school.

At 18 months past graduation, several competitive employment variables differentiated the groups (Table 8). First, significant differences were found between those working and those in school only in the total number of weeks worked (Fisher PLSD=43.40, df=12, p<.05) as well as the number of weeks worked per job (Fisher PLSD=17.95, df=12, p<.05). Students who were working full-or part-time at 18 months past graduation had averaged 49.5 work weeks during the school year over 4 years of high school, 23.4 weeks per job. This contrasted with 5.2 work weeks and 2.6 weeks per job for youth who were in school only at 18 months past graduation. Second, the number of jobs (Fisher PLSD=1.01, df=12, p<.05) and the number of hours worked (Fisher PLSD=9.08, df=12, p<.05) were related to status at 18 months. Those who were working 18 months following graduation had worked an average of 1.9 jobs during high school and had averaged 25.4 hours per week on those jobs. Those who were not working but in school at 18 months had worked only an average of .4 jobs during high school for 2 hours a week per job. Those not engaged at 18 months past graduation had also averaged less than 1 job while in high school.

Competitive Summer Employment. The number of hours worked per week in summer jobs differentiated youth who were working at 6-months from those who were not engaged; Group 1 averaged 18.1 hours of summer work per week compared to only 4.7 hours for Group 3 (Fisher PLSD=12.65, df=28, p<.05); (Table 9). The number of summer jobs held across 4 years of high school differentiated workers from both other groups; those employed at 6 months past graduation had had 1.8 summer jobs during high school in contrast to .7 and .6 for those in school only and those not engaged. The number of weeks worked during the summer also differentiated workers from those in school at 6-months; youth employed at 6 months past graduation had averaged 17.8 weeks of summer employment during high school compared to only 7.3 for those in school only at 6 months past graduation. The number of weeks per summer job was unrelated to work status at 6 months out of high school.

None of the summer-job variables were significantly related to work status at 18 months.

DISCUSSION

The focus of this study was to explore the relationship between vocational preparation and competitive employment experiences of students with SED during their high school years and their postsecondary employment and schooling. Findings indicated that neither the extent nor the nature of the vocational classes taken in high school, nor participation in in-school work-study opportunities appeared to be related to postsecondary outcomes, but competitive employment during the school year and in the summer were. Employment outcomes at 6 months past graduation were related to the number of hours worked per week during high school and in the summer. Employment outcomes at 18 months past graduation were related to the number of jobs obtained during high school, weeks worked per job, hours worked per week, and total number of weeks worked. Status at 18 months was unrelated to summer employment.

In the approved private schools, where 88% of the sample received their vocational education, most vocational classes involved discussions of types of jobs and of job acquisition skills and learning appropriate workplace behaviors. In other words, vocational class offerings seemed limited to career awareness or woodshop (and other basic benchwork skills), and living skills. It is no wonder then, that our findings regarding the usefulness of secondary vocational preparation in later employment outcomes support those of Farding et al. (1985), Rumberger and Daymont (1984), and Thornton, et al. (1988); they, too, found no relationship between scattered vocational coursework and jobs after high school.

In one secondary approved private school, comprehensive vocational training in an area vocational center was available once students demonstrated appropriate behavior and classroom achievement for a sustained period of time. But of the 5 students in our sample who attended the area vocational school part time, 4 attended for one year or less. At 6 months past graduation, three of these 5 young adults were attending technical schools, 2 full time, and 1 part time and only two were working, one delivering pizza, the other on an assembly line.

In the public high school, class offerings were more extensive--child care, office occupations, business and marketing, construction, electronics, etc. Five students in our sample took fewer than 4 vocational education classes, and hopped from one introductory course to another, such as from jewelry to construction to food service, acquiring few marketable skills in any one area. Nevertheless, at 6 months past graduation, only 1 of the 5 was not productively engaged. Of the remaining youths 2 were in school full-time and working part-time, one was in the Marine Corps, and one was employed part-time in a restaurant. The two youth who had been out of high school 18 months were both in school full-time and working part-time. Of the 5 students who engaged in intensive vocational preparation (four or more classes in one area), only one found a part-time postsecondary position related to his high school vocational training. Two points are clear: the number of vocational classes does not accurately reflect the depth of students' skill-training, and both the extent and nature of course content rather than simply the number of courses taken must be understood to explain postsecondary outcomes.

When asked to reflect back on their secondary vocational training, only 17 of the 42 graduates recalled receiving any help in making career decisions. Of those, 2 talked of individual help from a specific teacher and 3 had discussed job options in a career awareness class. Twenty-two recalled help with job acquisition skills through mock interviews and resume development. Vocational programs seem to have provided students with experience in the job application process, but this could not compensate for the fact that graduates presented themselves as unskilled potential employees.

Work Study. Like vocational classes, work-study appears to have offered few opportunities to practice skills needed in the "real" world. In the approved private schools, most work-study positions were school-based; students accrued work experience as office or teacher aides or as maintenance assistants. These jobs certainly do not lead to a career path. As one graduate remarked, "I was the office gopher but that did not help me get a job. The boss wants someone who can do more than run errands or the copier machine." Not surprisingly, only one student mentioned work-study as having influenced postsecondary employment decisions. She had participated in a community-based work-study experience in the office of a small business during high school, and at 6 months past graduation, she was employed full-time as a secretary. In work-study jobs, emphasis was on "employer-pleasing skills" such as following directions, punctuality, relationships with co-workers and supervisors rather than on skill-training. As one staff member explained, "Unless our students demonstrate appropriate workplace behaviors, all the typing or food service skills in the world will not help them hang onto a job."

In the public high schools, school-based work-study was not offered although 2 of the 5 public school students in our sample had experienced community-based work-study. One youth entered the Marine Corps immediately following graduation and the other enrolled in business school and was also working part-time as a nursing home aide at the time of both interviews. Secondary vocational counselors remarked that union rules and the current depressed marketplace made obtaining co-operative work-study difficult.

Given the absence of extensive skill-training and the hurdles youth faced in obtaining community-based work-study, it is not surprising that neither the amount of vocational coursework nor the amount of work-study was found to be related to later employment. But this is a disturbing finding, since research indicates that SED students are unlikely to seek postsecondary training and, therefore, have even greater need for a substantive vocational experiences and opportunities during high school.

Competitive High School Employment

Competitive School Year Employment. The number of jobs held, number of weeks worked per job, hours worked per week and the total number of weeks worked during the high school years were all significantly higher for youth employed at 18 months past graduation. These results are consistent with those of Hasazi et al. (1985) and Rusch and Phelps (1987). It may be that our youth with SED were demonstrating the ability to attend to more than one activity at a time (i.e. schoolwork and a job), and that that is a characteristic needed in a successful adjustment to adult responsibilities. Furthermore, since many of our youth were able to sustain school year employment over a fairly long period of time (averaged 23.4 weeks per job for an average of 25.4 hours per week), they may also have had more opportunity to develop both appropriate workplace behaviors and job-related skills. Clearly, working while in high school did more in terms of preparing youth for work than the vocational coursework taken while in school.

Competitive Summer Employment. Only the number of hours worked per week in summer jobs differentiated youth at work at 6 months following graduation from those not engaged. Since summer employment was unrelated to employment status at 18 months, it may be that summer employment only exerts temporary influence on work status, while community-based employment during the school year produces more lasting effects and more significantly influences postsecondary outcomes during the period in which youth typically flounder.

At first glance, the percent of those at work and in school at 6 and at 18 months after graduation seems to indicate a high level of stability. However, closer examination of the number of job changes made in the 18 months following high school--all lateral moves in low-paying positions--reveals that those at work were indeed floundering. Only 33% had had just one job while 42% had held two positions, and 25% had had three different jobs.

Enhancing Future Secondary Vocational Preparation

We offer three recommendations that build on our findings and what we believe are realistic ways to accomplish them. First, students should have opportunities very early in their high school years to explore a broad variety of vocational options. Second, students need to be provided both the time and the resources to pursue comprehensive vocational training in a marketable field. And third, students should have opportunity to engage in paid community work as well as structured opportunities to discuss those jobs and the challenges they present, to reflect on work experience, and to develop job skills and problem solving strategies.

These recommendations require time and resources which may not be readily available, especially in small, approved private schools. But, cooperative arrangements with community-referenced, area vocational centers or public comprehensive high schools may provide access to staff and resources outside the limits of the small school budget. Since scheduling constraints imposed by travel during the school day may well be a factor in providing these experiences, approved private schools might consider mainstreaming upper level youth several days a week into a vocational education setting. Another option might be to extend secondary schooling for students with SED into a fifth high school year, since by law they are already entitled to a free, appropriate public education at least until age 21. During this fifth year, students might engage in comprehensive vocational training *and* paid-employment so that school exiters would have marketable skills, appropriate workplace behaviors, and work experience to offer potential career path employers. It is relatively simple to propose these recommendations but we recognize that there are very real barriers to implementing them in the approved private schools that serve the most seriously involved of SED youth. Constraints are imposed by staff training, availability of appropriate facilities, student and staff schedules, and time needed for valuable intensive therapy. In addition, if students focus on comprehensive training in one vocational area early in their high school years it may force them to make a 'career' choice before they have a clear understanding of what they want to do and what they are good at. It would certainly limit their opportunities to investigate alternative vocational options. This tension between focus and exploration is perhaps greater in this population, so prone to abandoning the school enterprise as soon as it is considered meaningless. It is also greater because, while the youth who were the subjects of our research are in many ways similar to others with disabilities and to youth in the general population in their teenage interests and employment patterns, the seriousness of their emotional disturbance confounds their transition to adult life. It is difficult to forecast longterm outcomes for these youth, except that research indicates that it will likely be very troubled; expanding vocational preparation to enhance postsecondary employment outcomes must be undertaken very thoughtfully and on an individual basis.

References

Bullis, M. & Gaylord-Ross, R. (1991). Moving on: Transitions for youth with behavioral disorders. Council for Exceptional Children. Reston, VA.

Edgar, E. & Levine, P. (1987, December). A longitudinal study of graduates of special education. Keynote presentation. In Chadsey-Rusch, J. (Ed.), Project Director's Annual Meeting. Washington, DC.

Eleventh annual report to congress on the implementation of the individuals with disabilities education act (1989). To assure the free appropriate public education of all handicapped children. U.S. Government Printing Office.

Fardig, D., Algozzine, R.F., Schwartz, S.E., Hensel, J.W., & Westling, D.L. (1985). Post secondary vocational adjustment of rural, mildly handicapped students. Exceptional Children, 52(2), 115-121.

Hasazi, S., Gordon, L., & Roe, C. (1985). Factors associated with the employment status of handicapped youth exiting high school from 1979 to 1983. Exceptional Children, 51(6), 455-469.

The national commission on children (1991). Beyond rhetoric: A new American agenda for children and families. Final report of the national commission on children. (Stock No. 040-000-00559-5). Washington, DC: U.S. Government Printing Office.

Neel, R.S., Meadows, N., Levine, P., & Edgar, E.B. (1988, May). What happens after special education: A statewide follow-up study of secondary students who have behavioral disorders. Behavioral Disorders, 13(3), 209-216.

Rumberger, R. & Daymont, T. (1984). The economic value of academic and vocational training acquired in high school. In M. Borus (Ed.) Youth and the labor market: Analysis of the national longitudinal survey, pp. 157-191, Kalamazoo, MI. Upjohn Institute for Employment Research.

Rusch, F.R. & Phelps, L.A. (1987). Secondary special education and transition from school to work: A national priority. Exceptional Children, 53(6), 487-492.

Thornton, H. & Zigmond, N. (1988). Secondary vocational training for learning disabled students and its relationship to school completion status and post school outcomes. Illinois Schools Journal, 67(2), 37-54.

Wagner, M., Blackerby, J., D'Amico, R., Marder, C., & Newman, L. (1992, Review Draft). What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students. Prepared for The Office of Special Education Programs, U.S. Department of Education. Unpublished manuscript.

Table 1

Vocational Preparation and Competitive Employment During Four Years of High School for the Total Sample (N=42)

	M	SD
Type of Preparation		
Number of:		
Vocational Classes	3.64	2.45
Work Study Jobs	1.02	1.20
Weeks of Work Study	19.76	26.54
Competitive School Year Employment		
Number of:		
School-Year Jobs	1.33	1.57
Weeks Worked	33.50	36.45
Weeks Per Job	17.17	16.23
Hours Worked Per Week	12.83	11.72
Competitive Summer Employment		
Number of:		
Summer Jobs	1.21	1.41
Weeks Worked	12.70	14.27
Weeks Per Job	6.29	6.06
Hours Worked Per Week	14.07	14.86

Table 2

Productive Engagement Status at 6-Months Past Graduation (N=41)

	Working Only	Working & In School	In School Only	Not Engaged
Number of Students	10	12	12	7
Percent of Students	24.3	29.3	29.3	17.1

Table 3

Productive Engagement Status at 18-Months Past Graduation (N=16)

	Working Only	Working & In School	In School Only	Not Engaged
Number of Students	2	6	5	3
Percent of Students	12.5	37.5	31.2	18.8

Table 4

Number and Percent of Youth Working or In School at 6- and 18-Months Past Graduation

Interview Interval	At Work Number (%)	In school Only Number (%)	Not Engaged Number (%)
6-Months N=41	22 (54%)	12 (29%)	7 (17%)
18-Months N=16	8 (50%)	5 (31%)	3 (19%)

Table 5

Stability of Engaged Youth as indicated by Number of Jobs Held and Schools Attended Over the 18-Months Since Graduation

	JOBS		SCHOOLS	
# of Jobs Held, Schools Attended	# of Youth (N=12)	% of Youth	# of Youth (N=7)	% of Youth
1	4	33.3	8	72.7
2	5	41.7	3	27.3
3	3	25.0		

Table 6

High School Vocational Preparation of Youth Classified According to Engagement Status at 6-Months Past Graduation

	GROUP		
	At Work (N=22) M (SD)	In School (N=12) M (SD)	Not Engaged (N=7) M (SD)
Number of Vocational Classes	3.73 (2.78)	3.67 (1.92)	3.57 (2.57)
Number of Work Study Jobs	.91 (1.44)	1.17 (.94)	1.14 (.90)
Number of Weeks of Work Study Jobs	16.0 (25.12)	25.67 (31.33)	19.71 (25.68)

Table 7

Comparison of Competitive School Year Employment and Postsecondary Employment at 6-Months Past Graduation (N=41)

	At Work (Group 1)	In School (Group 2)	Not Engaged (Group 3)
Number of:			
Jobs School Year			
M:	1.77	.67	1.14
SD:	(1.90)	(.89)	(1.07)
Weeks Worked			
M:	43.14	22.33	26.57
SD:	(39.74)	(30.58)	(32.31)
Weeks Per Job			
M:	19.97	13.83	15.95
SD:	(16.20)	(17.59)	(15.23)
Hours Per Week			
M:	*15.77	6.33	13.71
SD:	(11.74)	(10.47)	(11.41)

* Significant Difference between means underlined at p<.05

Table 8

Comparison of Competitive School Year Employment and Postsecondary Employment at 18-Months Past Graduation (N=16)

	At Work (Group 1)	In School (Group 2)	Not Engaged (Group 3)
Jobs School Year			
M:	1.88	.40	.67
SD:	(.64)	(.89)	(1.16)
Weeks Worked			
M:	49.5	5.2	26.67
SD:	(40.24)	(11.63)	(46.19)
Weeks Worked Per Job			
M:	23.38	2.6	13.33
SD:	(14.92)	(5.81)	(23.09)
Hours Worked Per Week			
M:	25.38	2.00	3.33
SD:	(8.94)	(4.47)	(5.77)

* Significant Difference in means underlined at p<.05

Table 9

Comparison of Summer and Postsecondary Employment Six Months Past Graduation (N=41)

	At Work (Group 1)	In School (Group 2)	Not Engaged (Group 3)
Summer Jobs			
M:	1.77	.67	.57
SD:	(1.57)	(.78)	(1.13)
	*		
Weeks Worked			
M:	17.77	7.33	7.71
SD:	(15.54)	(8.67)	(14.16)
Weeks Per Job			
M:	8.84	6.60	6.00
SD:	(5.10)	(5.82)	(8.49)
Hours Worked			
M:	18.09	13.33	4.71
SD:	(14.58)	(16.56)	(8.10)

* Significant Difference in means underlined at p<.05

LIFE CYCLES OF ATTAINMENT TARGETS

FOR JOB-RELATED CURRICULA:

THE DIFFERENCE BETWEEN PRE-SERVICE AND IN-SERVICE

VOCATIONAL EDUCATION

Paper presented at the Annual Meeting of the AERA at Atlanta on April 12-16 1993

Martin Mulder, Ph.D.
Charlotte Laret
Ralph Maslowski

University of Twente
Faculty of Educational Science and Technology
Department of Curriculum
P.O. Box 217
7500 AE Enschede
The Netherlands

OBJECTIVES

Developing and implementing national goals, or attainment targets, for all kind of educational programs is en vogue since the beginning fo the ninetees. The objective of the study that will be presented in this paper was to analyse the life cycle of such attainment targets for job-related curricula of post-secondary pre-service vocational education and in-service vocational education. The major issue in determining attainment targets for these curricula is whether they should be focussing on basic knowledge and skills that are needed for school-to-work transition, or whether they should be focussing on specific knowledge and skills that are required in certain jobs. This generic-specific debate on attainment targets in post-secondary job-related curricula has never been resolved. The case is being made in this paper for differentiating generic and specific attainment targets, and to allocate generic attainment targets in initial educational programs, and specific attainment targets in advanced levels of (in-service) post-secondary education and training programs. The rationale for this vision is that the elementary levels of post-secondary vocational education are rather stable as to the content of the curriculum, whereas the advanced levels of in service education and training show more differentiation and a more detailed precision as to articulation of the curriculum to the performance requirements in attain trades of business and industry. Elementary levels of post-secondary vocational education should be rather generic to disclose multiple avenues for differentiation and specialization. In the paper the assumption is tested whether generic attainment targets have a longer life cycle then specific attainment targets. If this is the case, the rationale for generic initial stages in vocational preparation is affirmed, as advanced levels of vocational preparation are more flexible and thus more easy to change than the initial stages of job-related curricula.

CONCEPTUAL FRAMEWORK

Many vocational curriculum systems face imperfections of fit between job profiles and curriculum content. Requirements of business and industry (that are condensed into those job profiles) furthermore are temporary fixations of needs, of which in most cases the reliability and validity are not known. Especially in domains such as new technologies business and industry as well as vocational schools and colleges are faced with constant and ever accelerating change. This results in the dilemma of the delay factor of curriculum development and implementations for vocational education, on the one hand, and the urgent need for new curriculum content on new technologies. This dilemma is even complicated by the fact that developments are moving that fast, that needs are only temporary. A solution of this dilemma is to differentiate between basic and specific knowledge and skills, contingent with vocational curriculum functions: initial vocational qualification, and further specialized qualification in advanced levels of in-service vocational education and training.

Attainment targets for such programs were determined and approved in four projects that lasted from 1985 to 1989. During 1991-1992 a selection of these attainment targets was evaluated by those persons who approved the attainment targets within the projects. The expectation in the study is that the life cycle of the attainment targets is contingent upon the curriculum function: generic or specific. But personal characteristics, curriculum validation characteristics and the content characteristics of the curriculum domain may also influence the life cycle of attainment targets. Furthermore, short term and long term opinions can be distinguished. This is represented in Figure 1.

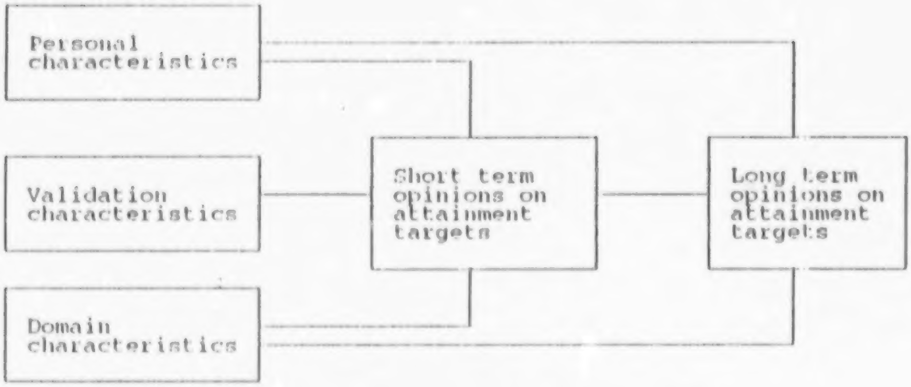

Personal characteristics
Validation characteristics
Domain characteristics
Short term opinions on attainment targets
Long term opinions on attainment targets

Figure 1: Conceptual framework of the life cycle of attainment targets.

It is assumed that personal, validation and domain characteristics influence short term opinions on attainment targets directly, and that personal and domain characteristics and short term opinions on attainment targets also influence long term opinions on attainment targets directly, but that validation characteristics influence long term opinions on attainment targets indirectly.

In this paper we will test several relations between the long term opinions on attainment targets and variables that fit in the conceptual framework. For the personal characteristics these variables are clustered in three groups: organization, job and development related variables. The reasons to differentiate these clusters of variables is that they are often thought of as key variables in the selection of participants for validation sessions. Within these clusters the following variables are distinguished. For the 'organizational' cluster: the employer of the participant in validation sessions, the size of the organization in which he or she is working an the level of innovation of that organization. The variable 'employer' signifies business and industry on the one hand, and education on the other. It is ofthen thought that representatives of both the labor and education system have different perspectives on the importance of certain curriculum content. It is for instance thought that representatives from industry want more labor market and specific skills that those from education, who view the labor market as a heterogeneous system in which generic skills are more flexible and multiple employable. The 'size' of the organization in which the representative is employed is also being thought of as a variable that has to be taken into account in the composition of curriculum validation groups. It is thought that representatives of smaller organizations stress the importance of broad skills as jobs in these organizations are relatively broad. The opposite is the case in large organizations. The jobs profiles in those organizations are more often smaller and more specialized. Therefore employers in larger organizations more often stress specific skills and learning skills as their employees receive additional job related training. Finally, the level of innovation is also often seen as being important, because pioneer companies need a higher level of certain expertise as creativity, problem solving and communication skills. Therefore they may stress different knowledge and skills differently.

For the 'job' cluster: the change of the job of the participant in the validation session and the increase or decrease of his or her responsabilities. The variable 'job change' signifies the type of change of the job of participants in validation sessions. This change can be in the direction of more specialization of de-specialization. Representatives from managerial jobs may appreciate productive interaction skills for instance, whereas technical specialists may stress technical competence. The variable 'job responsability' signifies the level to which the responsabilities of the representative have increased or decreased. Participants who made vertical progression the job structure may assess job requirements differently than those who remained at the same or at a lower level of responsability.

For the 'development' cluster the following variables were differentiated: the competence of the partipant of validations sessions, his or her activities to catch up the latest developments in the field, and the time that he or she is spending on learning these new developments. The 'competence' variable means the level of domain specific competence of the participants in validation sessions. Competence was a conditio sine qua non for participation in curriculum validation sessions. Changes in job content and responsabilities may have changed the specific expertise of the participants of the validation sessions. The 'activity' variable means the kinds of activities the participants have performed to remain informed about the latest innovations in the field. Training, visiting seminars, conferences, exhibitions, and reading articles and books, are examples of such development activities. The 'time' variables means the time that the participant has spent on his or her development in the field. The best indicator of this time is the percentage of the working time as it accounts for differences in the amount of working hours per week by the respondents.

For the validation characteristics we took the major variable that relates to the basic hypothesis of this paper, which is the type of curriculum content for the pre- and post-service educational programs. This curriculum content can be more generic or more specific.

For the domain of the work that is related to the vocational education programs (which means: the content of the work of the target group of the vocational education program) both changes in the level of job requirements and the level of change in the tasks are distinguished. The 'job requirement variable' means the change that has taken place with respect to the level of the job requirements. Certain jobs have upgraded, others downgraded. The job requirements have altered accordingly. The 'task change' level signifies the level of change in the jobs, which can be expressed as the percentage of the old tasks that has been changed.

DATA SOURCE, METHODS AND TECHNIQUES

Three projects provided data for this study. These projects were carried out in 1985 to 1987. One case was on post-initial further training (in-service) and the other two on initial vocational education. The 32 persons who validated attainment targets in these projects were asked to re-validate these attainment targets in 1991-1992.

The variables discussed above are translated into questionnaires that were sent to the respondents along with a selection of curriculum content items. These items were selected from lists of attainment targets that were validated in the projects. The number of items varied by project however, as well as the relevance and attainment level of the attainment targets. Therefore a proportional stratified selection of items is made from the lists. By this procedure the samples are represenative for the lists with attainment targets.

The curriculum content items had to be re-rated according to a comparable procedure that was followed in the validation sessions. The value labels of the four-point that is used for this purpose are: 1 = completely redundant; 2 = unimportant; 3 = important; 4 = absolutely necessary. Weighted means on the long-term relevance are computed for the knowledge and skills items and all items together. The latter total mean score is used as the dependant variable in testing the significance of the relations between the variables within the clusters described above. Because of the fact that the measurement level of the variables in these clusters vary, different tests are use. For nominal variables the t-test or oneway analysis of variance (depending on the number of groups that needs to be taken into account) is most appropriate (the dependant variable is measured at interval level), for ordinal variables the rank correlation test, and for ratio variables the Pearson correlation test.

The differences in long-term importance were compared by case. On theoretical grounds it is expected that the re-ratings differ by case, and that the mean long-term importance is higher for the attainment targets in the two cases in initial vocational education (with emphasis on broad generic skills), and lower in the case on post-initial training (with emphasis on specific skills). These differences are tested with a One-way analysis of variance.

RESULTS AND CONCLUSIONS

The difference between the mean long-term relevance of the generic and specific attainment targets is statistically significant ($F = 9.04$; $p = .005$). This means that the data support the theoretical expectation. The basic knowledge and skills for the pre-service (initial) vocational education programs have a longer life-cycle than specific knowledge and skills for the in-serve (post-initial) vocational training program. On the basis of this analysis we can not generalize to other vocational education programs, but we expect the same trend as we detected here: general attainment targets will show long-term relevance longer than job-specific attainment targets. When this assumption, for which we found evidence in this study, holds in other programs, curriculum developers should be sensitive to the level of job-specificity of attainment targets, for the more specific attainment targets need to be changed or replaced first.

The results show that all validated attainment targets have a long life cycle. The total mean score is 3.23 (sd = .38), with a lowest score of 2.68.

The results on the tests between the mean score on long-term relevance of attainment targets on the one hand, and the variables in the clusters described above are depicted in Table 1.

Apart from the specificity of the attainment targets (or the curriculum as it is more generally called in the Table), other significant relations are (in ascending order of significance): 'responsability', 'employer', 'competence', 'change', and 'time'. These variables are significantly related to the long-term opinions on the relevance of curriculum content items (the attainment targets). This means that organizers of curriculum validation panels, and probably more generally also managers and supervisors of project groups for curriculum development in vocational education and training, should be aware of these phenomena. Curriculum validation groups that are not respresentative with respect to these variables face the risk of producing results that can not be justified.

It is remarkable that the job responsability of participants in curriculum validation groups shows a reciprocal correlation with long-term relevance scores. This means that those participants who have higher responsabilities in 1991-1992 compared to 1985-1987, evaluate the attainment targets as being less important than the others. This effect can be caused by the fact that persons on higher positions are less informed about the details of problems that are being caused by a lack of skills and knowledge. This explanation is confirmed by the fact that the domain specific competence of participants is positively related to long-term relevance scores. Domain specific expertise is more likely to be present with non-managerial professionals who 'grew out' of their original position (which they held during 1985-1987). This will especially be the case in a domain that is influenced by fast and profound change.

Table 1 Relationships between independent variables and the mean long term importance score on attainment targets.

Cluster	Variable	Measurement level	Test	Value	P-value	Significance[1]
Organization	Employer	Nominal	t-test	2.09	.05	**
	Size	Ordinal	rank r	-.09	.64	-
	Innovation	Ordinal	rank r	-.09	.64	-
Job	Change	Nominal	t-test	1.93	.06	*
	Responsability	Ordinal	rank r	-.45	.01	***
Development	Competence	Ordinal	rank r	.41	.02	**
	Activity	Ratio	Pearson r	.17	.34	-
	Time	Ratio	Pearson r	.34	.07	*
Curriculum	Specificity	Nominal	oneway	4.40	.02	**
Domain	Job requirement	Ordinal	rank r	-.15	.45	-
	Task change	Ratio	Pearson r	.09	.71	-

[1] * = $.05 < p \leq .10$
** = $.01 < p \leq .05$
*** = $p \leq .01$

REFERENCES

Mulder, M. (1992). *The Curriculum Conference.* Dissertation. Enschede: University of Twente, Department of Education.

Mulder, M. (1993). Deliberation in Curriculum Conferences. Dillon, J.T. (Ed.) *Deliberation in Society and Education.* Norwood: Ablex (in press).

Using Concept Mapping Techniques to Compare Stakeholder Groups' Perceptions of Tech Prep

Chris A. Roegge
Tim L. Wentling
James A. Leach
Dan C. Brown

University of Illinois at Urbana-Champaign

Vocational Education SIG
American Educational Research Association Annual Meeting
April 13, 1993
Atlanta, Georgia

Introduction

The Perkins Act of 1990 defines Tech Prep programs as combined secondary and postsecondary programs which lead to the completion of an associate degree or two-year certificate, provide technical preparation in a specified field, build student competence in math, science and communications, and lead to employment. Within this rather broad definition, specifics such as instructional content, organizational structure, clientele, and delivery structures (to name a few) are left open to interpretation.

In Illinois, successful implementation of Tech Prep has been described as contingent upon the development of three important partnerships: (1) academic and technical educators (2) secondary and post-secondary educators, and (3) educators and business and industry representatives. In today's educational climate Tech Prep is expected to address serious problems through those partnerships (e.g., high dropout rates, deficits in work-place basic skills, keeping up with rapid advancements in technology, etc.). The Illinois State Board of Education (ISBE) has provided funding for the development and implementation of Tech Prep pilot projects to consortia of high schools and community colleges throghout the state.

The Tech Prep implementation guidelines provided by State staff supported and extended the intent of the Tech Prep initiative in the Perkins Act . The description was intended to promote a general understanding of Tech Prep in Illinois and to provide overall guidance to personnel involved in the Illinois Tech Prep projects. The local consortia were responsible for planning and implementation, that is, for determining what specific elements would comprise their Tech Prep instructional programs.

Purpose of the Study

Two years into the development of the Illinois Tech Prep programs, there was a need to describe the conceptual structure of Tech Prep as it was emerging in the various prototypes. The purpose of the study was to develop a conceptual framework for Tech Prep based on the perceptions of personnel involved in the planning and implementation of local Tech Prep programs. A conceptual framework was needed to enhance understanding of the perceptions of Tech Prep stakeholders throughout the state and to provide the basis for communication among stakeholders and policy decisions related to the Tech Prep prototype projects. Specifically, two sub-questions were addressed in the study:

1. How is Tech Prep conceptualized by:
    a. secondary teachers, counselors and administrators?
    b. postseondary instructors, counselors, and administrators?
    c. employers?
    d. state vocational education staff?

2. How do the various subgroups differ in their perceptions of Tech Prep?

Methodology

A "structured conceptualization" process referred to as *concept mapping* (Trochim, 1989) was used with key Tech Prep stakeholders to develop a conceptual framework which operationally defined Illinois Tech Prep as implemented at the local level. The concept mapping process as utilized in this study provided a pictorial representation of the key stakeholders' perceptions of Tech Prep. More specifically, the concept mapping process displayed the major components of Tech Prep, helped identify relationships between the components, and identified the relative priorities placed on each component and cluster of related components. This representation facilitated discussions which served to identify themes and concepts underlying the key stakeholders' perceptions.

Sample Selection

Respondents for this study represented the entire population of all personnel involved in the design and development of funded Tech Prep projects in Illinois. This included state-level vocational education staff, directors of the 31 Tech Prep consortia, educators (administrators, faculty and counselors) from community colleges and secondary schools involved in Tech Prep consortia, and local employers involved in Tech Prep consortia. The list of 450 respondents was randomly selected from a population of over 2000 persons involved in Tech Prep, as identified by state vocational education staff.

Instrumentation

Trochim's (1989) concept mapping procedure requires that a set of statements which define the concept to be studies be generated by representatives of the population. First, the focus of the statements was established based on the following three questions: (1) What is Tech Prep? (2) What activities are important to the successful implementation of Tech Prep? and (3) What linkages are necessary to facilitate the implementation of Tech Prep?

Ninety-seven "defining" statements related to Tech Prep were generated through document analysis and individual and group interviews. Proposals and progress reports from 31 project sites were examined. Individual interviews were conducted with two private sector and two State education staff representatives. Conference calls were arranged to conduct five group interviews with a cross section of secondary and post-secondary Tech Prep personnel from several sites. Group interviews were conducted utilizing a brainstorming format. Ideas were collected until substantial redundancy appeared in the responses. Statements were consolidated and clarified to eliminate redundancy.

Two forms of instrumentation were developed. First, the 97 defining statements were each printed onto separate cards. Sets of cards were reproduced for each respondent. Second, four-point rating scale instruments containing each of the 97 statements were developed. The respondents were asked to first sort the statement cards into meaningful, mutually exclusive categories (Trochim, 1989). They were then asked to rate each statement on a scale of importance from 1 to 4, with 1 being "Not Important" and 4 being "Very Important".

Data Collection and Analysis

Card sets and rating instruments were sent to the 450 randomly selected persons representing Illinois Tech Prep stakeholders. For analysis, the population was divided into four subgroups: (1) State education staff, (2) employers (private sector representatives), (3) secondary educators (administrators, counselors, vocational teachers, and academic teachers), and (4) post-secondary educators (administrators, counselors, vocational teachers, and academic teachers). The 156 responses received included representation from all identified sub-groups, as follows: State staff, 6 respondents; employers, 16 respondents; postsecondary educators, 35 respondents; secondary educators, 99 respondents.

The Concept System software (Trochim, 1989) was utilized to analyze and represent the sorted data into interpretable clusters. The software used multidimensional scaling to plot the statements as points on a map, and cluster analysis to partition the statements into clusters. A "bridge value" was computed for each point and an average "bridge value" was computed for each cluster. These "bridge values" indicated the relative consistency with which statements were sorted together thus aiding in the subsequent interpretation step. This information allowed interpreters to determine which statements within a cluster were sorted together most consistently and thus were most representative of the overall theme in that cluster.

Average ratings for each statement and for each cluster were computed to establish group perceptions of importance by idea and cluster topic. Ratings data were not utilized in the construction of the cluster maps. The importance ratings were valuable because they allowed the examination of the respondents' thinking from a second perspective. The concept maps illustrated what concepts respondents grouped together, and the ratings data allowed respondents to describe their perceptions of priority for each concept.

The maps and cluster lists generated by the concept mapping analysis were then subjected to interpretation by study respondents. Two small groups, one representing study respondents, the other consisting of secondary, postsecondary and university educators, performed the interpretation in two separate settings. The participants identified predominant themes and relationships apparent in the statements contained within the clusters. Researchers then compared the interpretations of the two groups for consistency.

Results

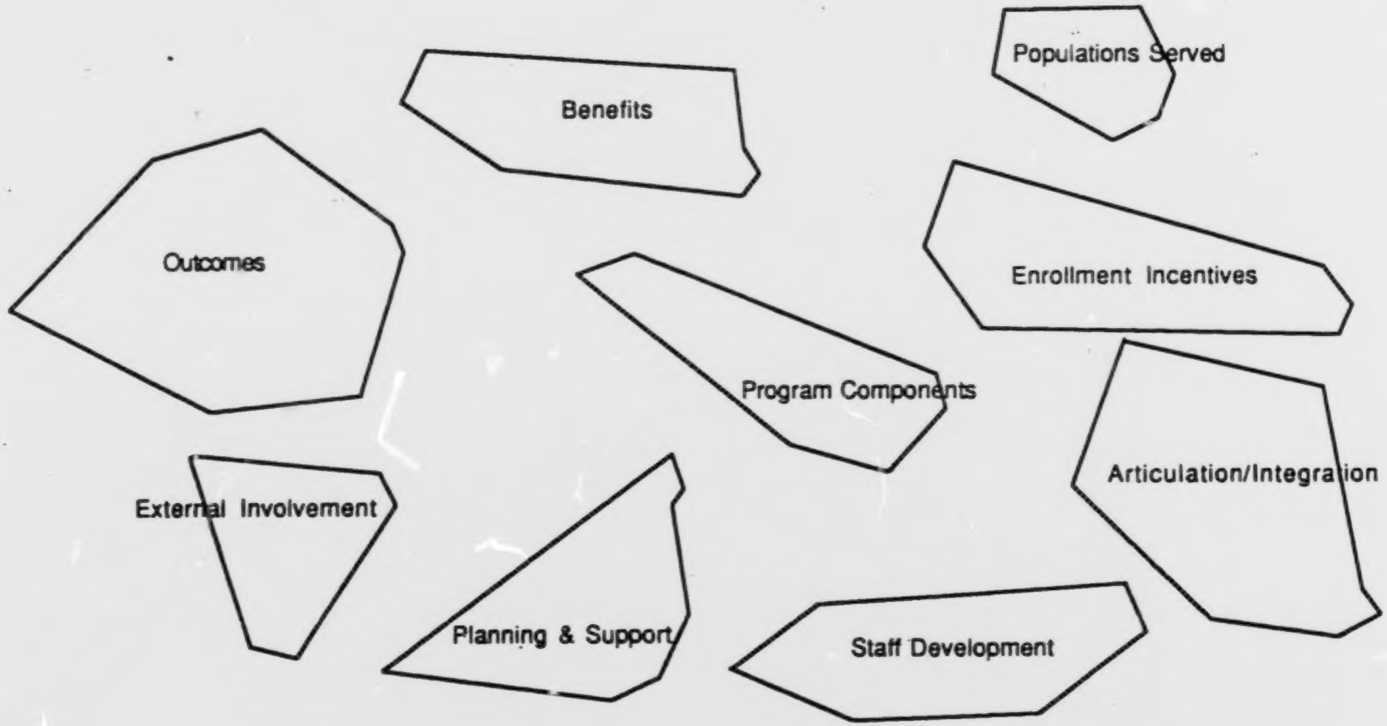
This study assessed the perceptions of Illinois stakeholders, and compared the perceptions of four subgroups (secondary educators, postsecondary educators, employers, and State education staff) regarding Tech Prep. All of the respondents were intimately acquainted with Tech Prep both conceptually and as it is presently being implemented in Illinois.

Overall Conceptualization of Tech Prep

The concept mapping procedure produced statements clustered into relatively homogeneous groupings based on relationships perceived by the stakeholders. Graphic or pictorial products emerged which simultaneously displayed major ideas and their relationships. One major product was the generation of clusters of statements each with some theme or identifiable thread of conceptual continuity. These clustered statements began to present a framework against which to interpret the large volume of information that will subsequently be gathered as Tech Prep is further explored and evaluated in Illinois. The overall stakeholders' cluster map is presented in Figure 1.

Figure 1

Tech Prep Concept Map


Populations Served
Benefits
Outcomes
Enrollment Incentives
Program Components
Articulation/Integration
External Involvement
Planning & Support
Staff Development

The relative placement of clusters of statements on the map is important. Clusters which appear in closer proximity on the map contain statements which have more similar themes. As an example, the *Outcomes* cluster is more similar in theme to the *Benefits* cluster than either are to the *Staff Development* cluster. The following clusters were defined and identified by the critical stakeholder groups:

- The *Outcomes* cluster statements included a combination of programmatic and individual outcomes often expressed in an assessment context.

- The statements included in the *Planning and Support* cluster related the process aspects of planning and support to implementation and evaluation.

- The statements contained in the *External Involvement* cluster also related the process aspects of planning and support to implementation and evaluation. The External involvement cluster differed from the Planning and Support cluster in that it began to define the roles external entities may play in Tech Prep programs (e.g., planning and development, support, delivery, and evaluation).

- *Articulation/Integration* cluster statements described linkages based on collaboration between vocational and academic faculty, between both secondary and post-secondary institutions and faculties, and between education and the private sector.

- The statements sorted into the *Benefits* cluster described a theme similar to that evident in the Outcomes cluster, but the themes described here were divided between benefits to students as individuals and benefits to the organization or program.

- The *Enrollment Incentives* cluster statements detailed process components of Tech Prep that attempt to meet individual needs, particularly the very individualized needs of the special populations student.

- The *Staff Development* cluster presented a collection of statements containing a consistent collaborative theme. These statements emphasized the importance of team activities and cooperation between the various subgroups in the implementation of Tech Prep.

- The *Program Components* statements were a loosely associated group of statements with a program processes theme.

- The *Populations Served* cluster statements identified for whom Tech Prep is intended, the students that Tech Prep should serve.

Conceptual Differences Among Subgroups

Four major subgroups were identified within the overall population: (1) secondary educators (teachers, administrators, counselors), (2) postsecondary educators (instructors, administrators, counselors), (3) employers, and (4) State education staff. Concept maps were developed and interpreted for each of the subgroups. Comparison of the maps established conceptual differences among the groups in their perceptions of Tech Prep.

Overall, it may be said that the subgroups were more similar than different in their perceptions of Tech Prep. The cluster themes listed above were common to virtually all subgroups, but there were some interesting differences in the way those themes were organized. The following sections will examine the perceptions of each subgroup using three organizers: processes, relationships, and products.

Processes

Generally, clusters which addressed processes were concerned with staff development, planning and implementation, and delivery of instruction. One cluster which was common in structure and content for all subgroups dealt with target populations, or clientele for Tech Prep programming. This was due, at least in part, to the wording of the statements which comprised the cluster. Each statement began with the phrase "targeted for..." In that sense, those statements were almost pre-clustered prior to any analysis or sorting by the participants.

Another common cluster theme was articulation. All subgroups identified a cluster which dealt in some way with establishing formal links between the secondary and postsecondary levels within Tech Prep programs. State staff and also secondary educators tended to view these linkages conceptually more as outcomes or benefits of Tech Prep rather than as process elements.

Relationships

The theme "collaboration" was prevalent in several clusters. All subgroups connected the concept of collaboration to staff development, implying that staff development for Tech Prep needs to involve all stakeholder groups, and that they all need staff development to implement Tech Prep successfully. Secondary and postsecondary educators identified a "business and industry linkages" cluster theme, indicating that formal structures be developed to ensure equitable participation of business and industry in Tech Prep development. Employers and State education staff approached this theme as a curricular function. In other words, their concept of linking with business and industry was ensuring that curricula meet the needs of business and industry. All subgroups identified the need for inter-agency and intra-agency support in Tech Prep planning and development.

Products

All subgroups except the state education leaders identified a distinct cluster based on outcomes. State education leaders dispersed statements related to student and program outcomes among various other clusters with themes like "benefits" or "program quality." The secondary and postsecondary educators, and the employers, identified specific clusters in which outcomes-related statements were concentrated.

Secondary educators and state education leaders identified "image" as a cluster theme, while the postsecondary educators and employers did not. The proximity of the image cluster to other outcomes-related clusers on the maps revealed that a positive program image was seen as an outcome of Tech Prep.

Perceptions of Importance

The second part of the study asked respondents to rate the importance of each defining statement on a scale of 1 to 4 (1=least important, 4=most important). This activity served to (1) prioritize the cluster themes, (2) identify salient individual statements, and (3) facilitate comparisons among the various subgroups.

Cluster Priorities

Average priority ratings were calculated for the identified clusters. In descending order, the priority of each cluster was as follows:

Cluster Theme	Mean Importance Rating
Outcomes	3.31
Planning and Support	3.23
External Involvement	3.19
Articulation/Integration	3.19
Benefits	3.18
Enrollment Incentives	2.96
Program Components	2.83
Populations Served	2.70

Highest Individual Item Priorities

Fourteen statements were almost universally accepted by the major sub groups as items of the highest importance (mean ratings of 3.5 or above) in the implementation of Tech Prep.

1. Improved communication, math, science, and computer skills
20. Improved work readiness
21. Improved problem solving skills
31. Improved perception of technical careers
9. Improved student motivation for learning
10. Improved student self-esteem
48. Appropriate facilities and equipment
83. Board support for Tech Prep concept and programs
58. Business & industry involvement in developing tech prep curriculum
65. Employer feedback on student performance
28. Integrated vocational and academic courses
36. Applied curriculum materials in math, science and communication
84. Secondary and post-secondary teacher collaboration
16. Increased number of high school and community college graduates
85. Counselor, teacher, administrator collaboration

Subgroup Comparisons

To explore interactions within the ratings data, analysis of variance was run on the ratings data using secondary and post-secondary level variables and academic teacher, vocational teacher, counselor, administrator and employer as employment status variables. Significant differences at the .05 level were then subjected to a

Scheffe test to identify significant differences in group ratings, again at the .05 level.

Of 97 defining statements generated, only three statistically significant differences in importance ratings existed between secondary and postsecondary educator subgroups. These are summarized below.

Statement	Secondary Mean	Postsecondary Mean
69. Vocational/academic teacher teams	3.38	2.97
70. Joint planning time	3.45	2.97
93. Targeted for students who learn better through application	3.44	2.97

There were statistically significant differences between employer and educator importance ratings on six of the defining statements.

Statement	Educator Mean	Employer Mean
7. Local budgetary support for Tech Prep	3.58	2.56
14. Building-level administrative support	3.59	2.73
75. External funding for Tech Prep activities	3.39	2.38
89. State and local government involvement	3.26	1.94
55. Tech Prep site coordinators	3.18	2.12
70. Joint planning time	3.39	2.44

Importance ratings of State education staff were significantly different from those of employers for four Tech Prep defining statements.

Statement	State Staff Mean	Employer Mean
14. Building-level administrative support	3.67	2.73
75. External funding for Tech Prep activities	3.17	2.38
55. Tech Prep site coordinators	3.17	2.12
70. Joint planning time	4.00	2.44

In studies where sample size is small, statistical differences may fail to appear due to low power. When this occurs it is possible to look at the pattern of non-significant findings and predict where we might expect to find significant differences if we had more power in the study to pick up those effects. It is important to remember that differences do not have to be statistically significant to be important (Dumont, 1989; Minium & Clark, 1982). The small size of the State education staff group provides just such a case. In comparing the State educatin staff group importance ratings with other groups it was determined that mean differences of 1/2 standard deviation or more, while not statistically significant, are important enough to warrant further attention.

State education staff rated several statements more than .5 standard deviation higher than at least one of the other subgroups. Some of the more interesting examples follow (the other subgroup to which the State education staff rating is compared is identified in parenthesis).

21. Improved problem solving skills (educators)
24. Achievement of state goals for learning (educators)
28. Integrated vocational and academic courses (employers)
23. Increased interagency collaboration (employers, educators)
12. Increased number of graduates from two-year occupational programs (educators)
81. Academic assistance for students unable to meet entrance requirements (educators, employers)
30. Paid internships for Tech Prep students (employers)
22. Instruction and experience in all aspects of industry (educators)
89. State and local government involvement (employers)
87. University personnel involved (employers, educators)

Also, several statements relating to the theme of collaborative staff development and delivery of instruction were rated at least .5 s.d. higher by state education leaders than by either educators or employers.

Only a few statements were rated .5 s.d. lower by State education staff than by educators and employers. Most potentially important among these were:

26. Certification of completion and competency achievement
7. Local budgetary support for Tech Prep (e.g., matching equipment funds)
15. Improved career awareness

Discussion of Results

The study yielded more information about elements which are important for implementing Tech Prep programs than about the structure of Tech Prep. The information gained in the study should prove very beneficial in guiding future program planning and evaluation efforts. It did not, however, lend itself to a concise definition of the Tech Prep concept.

All subgroups were similar in their conceptual views of Tech Prep. One interesting difference was the issue of program image, which was identifed as a cluster by secondary educators and State education staff. These two groups have been concerned for many years about the perceived negative image of vocational and technical education. Both appear to view Tech Prep as a vehicle for altering that image. This also indicates that both view Tech Prep as being closely tied to vocational and technical education.

More tangible differences existed in the importance ratings. Significant and/or potentially important differences in perceptions of the various subgroups regarding the relative importance of Tech Prep elements were found in the responses to 51 of the 97 statements. Two of these differences occurred between practitioner subgroups, three between the secondary and postsecondary groups, six between employers and educators, 29 between State education staff and educators and 40 between employers and State education staff. Why did these differences exist? How should they be interpreted? Which present the greatest threats or strengths upon which to build?

Two of the significant differences between secondary and postsecondary educators were related to vocational/academic instructor collaboration. Secondary staff perceived this as more important, not surprising given the emphasis at the secondary level on vocational/academic integration strategies which involve teacher collaboration. Postsecondary educators tend to view vocational/academic integration as a function of course-taking patterns rather than of teacher collaboration.

Many of the statements rated as more important by educators than by employers reflected "internal" educational concerns (e.g., administrative support, government involvement, site coordinators). Educators are concerned with how Tech Prep program initiatives will be supported, both financially and with other internal and extremal resources. Employers appear to be more concerned with program content and its relationship to their needs.

Many potentially important differences in importance ratings were between State education staff and everyone else. Most of these differences were simply due to the fact that the State education staff rated more statements higher than the other subgroups. State staff receive input from educators and employers, as well as from federal and state legislators, policy leaders, university staff, and personnel from other states. They tend to have a much larger picture of Tech Prep than do local educatots or employers, and are therefore concerned with many facets of the programs, rather than focusing on competency attainment (rated higher by employers) or local budgetary support for programs (rated higher by educators).

Implications

Concept mapping proved to be an effective tool for getting the stakeholder groups to conceptualize Tech Prep. Due to logistical factors, the specific methodology used for this study was somewhat different and perhaps more cumbersome than that described by Trochim (1989) but this also proved that concept mapping techniques could be adjusted and still produce viable results.

Given the importance of effective leadership and policy making, it is essential that State staff communicate their perceptions to educators and employers. They are viewing Tech Prep from a much broader perspective, one which is not always clearly perceived in the local communities. Increased awareness of the many inputs into Tech Prep programmatic decisions could make these decisions more palatable to local personnel and employers. Also, if local consortia are to be held accountable for certain aspects of Tech Prep programs, they must know which aspects are viewed by state leaders as most important.

Further research and evaluation should focus heavily on both school and work based student outcomes. Specific outcomes to be assessed were identified through the priority ratings. Thus an important component of further Tech Prep evaluation will be the collection and use of student outcomes data.

Given the degree of general agreement between employers and educators, further research should focus on the partnerships in Tech Prep. What are the roles and responsibilities of educators and employers in the local Tech Prep planning partnerships? What variation exists in the structure and function of Tech Prep partnerships within local consortia?

Identifying a specific target audience for Tech Prep is not an important issue. The results of the study indicate that stakeholders perceive Tech Prep to be appropriate for a broad audience, well beyond the middle 50th percentile so often identified as the prime clientele. Therefore, further evaluation should examine what students are currently identified as Tech Prep students and whether Tech Prep programming is reaching beyond "traditional" audiences .

References

Bragg, D. (1991). *Illinois tech prep planning strategies*. Springfield, IL: Illinois State Board of Education, Department of Adult, Vocational and Technical Education.

Dumont, J. (1989). Validity of multidimensional scaling in the context of structured conceptualization. *Evaluation and Program Planning, 12*, 81-86.

Minium, E. W., & Clark, R. B. (1982). *Elements of statistical reasoning*. New York: John Wiley and Sons.

Trochim, W. M. K. (1989). *The concept system* (computer program). Ithaca NY: Concept Systems

Variables that predict level of job satisfaction and intent to leave present employment among secondary teachers of vocational/technical education in the U. S.

C. Kenneth Tanner
Professor, Educational Leadership
The University of Georgia
Athens, GA 30602

Charles N. Warr,
Vocational Supervisor
McIntosh High School
Peachtree City, GA 30269

Running head: VARIABLES THAT PREDICT JOB SATISFACTION
AND INTENT TO LEAVE EMPLOYMENT

PREDICTOR VARIABLES

Variables that predict level of job satisfaction and intent to leave present employment among secondary teachers of vocational/technical education in the U. S.

Abstract

This study, based upon data provided by a national sample of 504 secondary VTE teachers, found that younger teachers were more likely to leave. They were also the least satisfied. Teachers with the longest tenure reported the lowest likelihood of intent to leave. Two independent variables classified as overall job satisfaction and satisfaction with coworkers predicted intent to leave. Three independent variables were found to have significant power to predict overall job satisfaction: pay satisfaction, teaching satisfaction, and satisfaction with supervision.

Variables that predict level of job satisfaction and intent to leave present employment among secondary teachers of vocational/technical education in the U. S.

Introduction

The problem of personnel turnover is always present in any organization. This is true because the organization may be put into the situation where an experienced staff member is lost, resulting in a reduction in efficiency. The consequence is that money and time must be expended on searching and training an applicant for the vacated position (Meyer, Beville, Magedanz & Hackert, 1979). Phillips (1990) reported that turnover costs average 1.5 times the annual salary of the position in question. Phillips also found that at least 80% of turnover costs are hidden and rarely measured. Wild and Dawson (1972) stated that strong correlations between job satisfaction and absenteeism and turnover would seem to make job satisfaction an important focus of organizations that desire to reduce absenteeism and turnover.

In the school setting, turnover among vocational and technical teachers can create a lack of continuity and consistency in the educational program. At a time when excellence in education is sought on all levels, any factor that affects program quality in a negative manner is an area of concern.

Objectives

The objectives of this study were as follows: 1. To find variables that would predict teachers' intent to leave the school setting, and 2. To predict the job satisfaction level of teachers. Meeting these objectives would therefore set the stage for determining the relationship between job satisfaction variables and intent to leave. Job satisfaction was identified by using two survey instruments; one that assessed teacher attitudes in five distinct aspects of the work place, and a second instrument that assessed overall work satisfaction.

Theoretical Framework

The premise supporting this study was that job turnover is linked to job satisfaction. Job satisfaction included overall job satisfaction, a measure of how interesting, pleasant, and enjoyable the job is, and satisfaction with work itself, pay, promotion, supervision, and co-workers. Therefore, if one intended to leave a position, one or more negative relationships among aspects of job satisfaction and intent to leave was expected. The theoretical framework is explored in more detail in the methods section, specifically the instrumentation part, and in the section of the paper that is concerned with causal models.

Job Satisfaction and Turnover

This study was guided by four questions that were generated from a review of the related literature. A finding of statistical significance on any of these concerns could provide leaders with answers and knowledge that would minimize the problems of turnover and dissatisfaction with the job among secondary school teachers in vocational/technical education. Therefore, a goal of this study was to provide information to educational leaders that might be instrumental in modifying vocational and technical teacher hiring, training, and certification policies. The questions are as follows:

1. Is there is a statistically significant mean

difference in overall job satisfaction scores between younger and older vocational teachers?

2. What is the relationship among the variables of age, tenure, education, wage earner status, gender, and intent to leave the school organization?

3. Does a statistically significant relationship exist among the variables of teaching, pay, supervision, opportunity for promotion, coworkers, and intent to leave the job?

4. To what degree is there a relationship among the variables of teaching, pay, supervision, opportunity for promotion, and coworkers with overall job satisfaction?

Job satisfaction has been divided into sub scales to facilitate measurement of a worker's job satisfaction. The following five sub scales are the results of work by Smith, Kendall, and Hulin (1969) and form the basis for the Job Descriptive Index (JDI)[1]: (a) work itself (teaching), (b) pay, (c) promotion opportunities, (d) coworkers, and (e) supervision. Each of these subscales served as an independent variable.

Independent Variables

Satisfaction with Work Itself. Nicholson, Wall, and Lischeron (1977) studied a sample of 95 steel workers and concluded that job satisfaction, particularly with the work itself, was negatively related to absenteeism and turnover. Manigone (1973) in a study of occupationally diverse adults, found correlations of -.13, -.22, and -.25 among three measures of overall satisfaction and turnover. Kraut (1975) studied short-term (18 month) and long-term (5.5 years) turnover and attitudes of a group of salesmen. JDI work satisfaction was found to have a -.14 correlation with short-term turnover, and a -.12 correlation with long-term turnover. Porter, Steers, Mowday, and Boulian (1974) in a study of psychiatric technicians found that job satisfaction as scored on the

JDI work sub scale was positively correlated with staying. Porter et al. also found overall job satisfaction to be much higher in stayers than leavers over a 10.5 month period. Koch and Steers (1978) found a -.31 correlation between JDI work satisfaction and turnover and reported a -.14 correlation between overall satisfaction and turnover in a group of non-managerial public sector employees. Waters and Roach (1973) and Waters, Roach, and Waters (1976), found that not only was the JDI work sub scale significantly related to job satisfaction and turnover, it was the only significant predictor of turnover. Ilgen and Dugoni (1977) in a study of 117 retail clerks found a -.31 correlation between overall job satisfaction and turnover. Rusbult and Farrell (1983) found that greater job satisfaction resulted in high job rewards and low job costs in a 12 month longitudinal study of 88 nurses and accountants who were newly hired. Muchinsky and Tuttle (1979) reported that 37 out of 41 studies showed a negative relationship between job satisfaction and turnover. However, Newman (1974) found that JDI work satisfaction was not significantly correlated to turnover in a study of nursing home personnel.

Satisfaction with Pay. Manigone (1973) found a -.16 correlation between pay satisfaction and turnover. Mobley, Horner, and Hollingsworth (1978) in a study of hospital employees found a .37 correlation between JDI pay and overall satisfaction and a -.37 correlation between JDI pay and intention to quit. However, Koch and Steers (1978) did not find a significant relationship between JDI pay and turnover in public sector employees, and Newman (1974) did not find a significant correlation in nursing home employees. Also, in a study of salesmen, neither Kraut (1975) nor Waters, Roach, and Waters (1976) found any correlation with pay and intent to remain with the organization.

In a study of English-speaking adults, Liou, Sylvia, and Brunk (1990) found a significant .12 correlation between income and job satisfaction. A study by Furey and Lauroesch (1986), found that high school teachers in the 30 to 40 year age range expressed dissatisfaction with their salary, status, and opportunity for advancement. The authors stated that "this is to be expected since teachers are in a structure that makes the satisfaction of those needs essentially impossible" (p. 246). Newman (1974) however, did not find a significant correlation between JDI pay and turnover in nursing home employees.

Homans (1953) stated that people could perceive pay as too low by comparison with others who were not basing their perception on the pay itself. Homans indicated that if a workers believe that their inputs are greater than their outcomes, they will experience dissatisfaction directed toward the person or company that controls the outcomes. Homans' view was later supported by Finn and Lee's (1972) study of Federal Public Health Service employees. Employees who perceived their salary to be inequitable were found to hold less favorable work-related attitudes and had a higher propensity to voluntarily leave the organization. Also, Carrell and Dittrich (1976) examined a metropolitan service organization's employee perceptions of fair treatment in the dimensions of pay rules, pay administration, work place, pay level, rule administration, and overall fairness. Perceived fairness was found to be a stronger predictor of absenteeism and turnover than job satisfaction. Carrell and Dittrich (1976) reported that pay level relative to others outside the organization was a particularly strong predictor of turnover. Pontius (1982) in a study of industrial educators found a significant rate of turnover due to the higher salaries offered by business and industry.

Satisfaction with Promotion. Kraut (1975) found a .18 correlation between intent to remain and satisfaction with advancement opportunities. Mobley, Horner, and Hollingsworth (1978) reported a .23 correlation between JDI promotion and overall satisfaction, and a -.25 correlation with intent to quit. Hom, Katerberg, and Hulin (1979) found a .12 correlation between JDI promotion and intent of National Guard members to reenlist. Hom et al. also found a .21 correlation between JDI promotion and organizational satisfaction. Marsh and Mannari (1977) found a -.22 correlation between Japanese electrical worker perceived chances of promotion and turnover. However, neither Koch and Steers (1978) nor Newman (1974) found a significant correlation between JDI promotion satisfaction and turnover.

Furey and Lauroesch (1986) reported that the limited opportunity for promotion was a source of dissatisfaction among the teacher population studied. Adler (1980) reported that individuals who were high in self-esteem were more likely to take personal responsibility for their own satisfactory job experiences than low self-esteem individuals.

Satisfaction with Supervision. Ilgen and Dugoni (1977) found a -.23 correlation between satisfaction with supervision and turnover in a sample of retail clerks. In a study of 94 registered nurses and practical nurses, Silber (1982) found that satisfaction with supervision was one of two direct predictors of turnover, the other predictor being intent to remain on the job. Futrell and Parasuraman (1984) studied 560 pharmaceutical sales and supervisory personnel. Results indicated that for "low performers" the JDI work subscale had a very high correlation with turnover

(-.50) versus a lower correlation (-.27) for high performers. Parsons, Herold, and Leatherwood (1985) studied turnover in a newly hired group of 51 hotel workers. Results indicated that positive responses from supervisors lead to internal attributions that were related to job satisfaction. Parsons et al. reported a -.41 correlation between positive response and turnover. These studies do not support the earlier findings of Waters, Roach and Waters (1976) who in a study of female clerical employees, found no significant relationship between satisfaction with supervision and termination. Mobley, Horner, and Hollingsworth (1978) in a study of hospital employees and Newman (1974) in a study of nursing home employees also reached a similar finding of no relationship. These findings also agree with Liou, Sylvia and Brunk (1990) who found no significant correlation with the supervision variable, although the finding was positively weighted.

Satisfaction with Coworkers. A study of salesmen by Kraut (1975) revealed a .16 correlation between satisfaction with teamwork and intent to remain with the company. Koch and Steers (1978) in a study of public sector employees found a significant correlation (-.21) between JDI coworker satisfaction and turnover. Mobley, Horner, and Hollingsworth (1978) found a .29 correlation between JDI coworker satisfaction and overall job satisfaction, and a -.10 correlation between coworker satisfaction and quitting. Hom, Katerberg, and Hulin (1979) found a .11 correlation between JDI coworker satisfaction and National Guard member reenlistment. However, Manigone (1973) and Waters, Roach, and Waters (1976), and Ilgen and Dugoni (1977) found no significant relationship.

Demographic Variables

Demographic factors consistently used by researchers to investigate job turnover are age, educational level, family responsibility and marital status, gender, tenure, and wage earner status. Because each of these factors served as independent variables, reviews of studies pertinent to each factor are discussed in the subsections that follow.

Age. Studies by Stone and Athelstan (1969), Farris (1971), Federico, Federico, and Lundquist (1976), and Waters, Roach, and Waters (1976) all reported a strong negative relationship between age increase and employee turnover. Manigone (1973) in a study of an occupationally diverse sample of adults, found that younger employees had higher turnover rates. Porter, Steers, Mowday, and Boulian (1974) in a longitudinal study of psychiatric technicians found that the mean age of stayers (31.9 years) was significantly higher than the mean age of leavers (23.9 years). Marsh and Mannari (1977) studied Japanese electrical company employees and found a .22 correlation of younger age with higher turnover. Mobley, Horner, and Hollingsworth (1978) found a correlation of .28 between age and overall job satisfaction as measured on the BRI (1951). Mobley et al. also reported a correlation of -.36 with intention to quit, and -.22 with actual turnover. Mobley et al. further reported that age correlated to intention to quit was -.49 and age correlated with actual turnover was -.21.

Janson and Martin (1982) examined age as a predictive variable for job satisfaction. The researchers found that older workers were more satisfied than younger workers and therefore less likely to leave the organization. Thus, younger employees exhibited a higher frequency of turnover. Williams and Hazer (1986) also found a positive correlation between age and job satisfaction. Liou, Sylvia, and Brunk (1990) studied a sample of 1473 English-speaking adults and found a significant correlation (.08) between job satisfaction and age.

Carrell and Elbert (1974) reported a positive linear relationship between age and job satisfaction up to age 50, when a decline in job satisfaction began to occur. Zietz (1990) studied the relationship between age and job satisfaction in a sample of 434 Federal government office workers. Zietz concluded that a curvilinear relationship existed in a "U" pattern, with satisfaction highest among oldest (55 years +) age group and the youngest (18-24 years) age group. Employees in late-middle career had the lowest amount of job satisfaction. Zietz reported that the employee perceptions of management climate, possibility for mobility, and personal influence affected the relationship of age to job satisfaction. Pontius (1982) found that turnover was highest for males 30 years of age and younger in a sample of industrial educators.

Educational Level. Research findings regarding the educational level of an employee as a predictor of turnover have been mixed. For example, female credit union workers who had reached higher educational levels were found to have lower tenure and higher turnover rates than their less educated peers (Federico et al. 1976). A study of an engineer and scientist population regarding educational level as a predictor variable of career mobility resulted in a curvilinear relationship (Cobern & Conlon, 1980). Employees with doctorates were the least mobile, those with master's degrees were the most mobile, and those with baccalaureate degrees were only slightly more mobile than those with doctorates. Researchers found that baccalaureate employees were older than the master's level employees and attributed the age factor to the difference in mobility. Low mobility of the doctoral level employees was attributed to the limited opportunities to leave the organization due to the specialization of the individuals' degrees.

Quinn and Baldi de Mandilovith (1977) found that individuals with college degrees were more satisfied with their jobs than employees who did not graduate from college. Quinn and Baldi de Mandilovith reported that the most dissatisfied employees were those who were over educated for their positions. Liou, Sylvia, and Brunk (1990) however, did not find a significant correlation between job satisfaction and educational level in their study of English-speaking adults.

Family Responsibility. The study of the relationship between family responsibility factors as a predictor of turnover has resulted in mixed findings. Knowles (1964) studied male factory workers and found a positive relationship between family size and turnover. However, Stone and Athelstan (1969) studied a group of female therapists and reported a negative relationship to turnover. Porter and Steers (1973) found that as a family increased in size, the male strengthened his commitment to maintain his present position within an organization. However, when the larger family placed increasing home demands on the female, she often quit work. Manigone (1973) found that single employees had higher turnover rates in a study of occupationally diverse adults, but Waters, Roach, and Waters (1976) found no significant correlation in a study of insurance company clerical employees.

Federico, Federico, and Lundquist (1976) studied a female population who were primary wage earners. Females who were primary wage earners rather than being in the traditional role of a secondary wage earner, were found to be less likely to leave the organization because of income needs. These findings led Federico et al. (1976) to suggest that primary versus secondary wage earner status was a more appropriate determinate variable than family size, which has not shown significant results as a predictor of turnover.

Kemper and Reichler (1976) studied a group of married and employed sociology students and found a positive relationship among martial satisfaction and three factors of intrinsic job satisfaction: (1) meaningful work, (2) liking for work and (3) control over the pace of work. Keaveny, Jackson, and Fossum (1976) studied a large group of persons from all backgrounds, and reported that married individuals indicated higher levels of job satisfaction than did single individuals in the study.

Gender. An employee's gender as a predictor of satisfaction and turnover has also been inconclusive (Mobley, Hand, and Meglino, 1979). Studies reviewed tended to yield mixed findings. Manigone (1973) found no significant relationship between gender and turnover in a study of occupationally diverse adults. Marsh and Mannari (1977) however, found a correlation of -.31 with women having the higher turnover rate. Mobley (1982) suggested that the effect of gender was difficult to isolate and that other variables probably interact. In a later study of plant employees Hulin and Smith (1976) however, found that in three plants females were significantly less satisfied than the males, with no significant differences at the fourth plant. Only 4% of the variance in job satisfaction could be accounted for by the individual's gender. Hulin and Smith stated that these findings supported the conclusions of their earlier investigations. By contrast, Robinson (1979) studied a group of male and female day care workers and found that males had a higher job turnover rate than females.

Horner (1982) in a study of school system employees reported that females experienced the highest job satisfaction. In contrast, Furey and Lauroesch (1986) found in a study of career teachers that patterns of satisfaction and dissatisfaction among female teachers appeared to conform generally to male patterns. Smith and Plant (1982) conducted a study of gender differences and job satisfaction in university professors and found that there were no significant differences for the variables of work, pay, and promotion, but male professors were significantly more satisfied in the areas of supervision and coworkers. Bartol and Wortman (1976) found no significant differences in job satisfaction between males and females in a study of hospital supervisory employees except that females were less satisfied with coworkers. Busch and Bush (1978) administered the JDI to 39 men matched with an equal number of women on critical variables. No significant differences were found in relation to job satisfaction, however women had higher propensity to leave scores. Liou, Sylvia, and Brunk (1990) found no significant correlation between English-speaking adults and job satisfaction.

Mobley (1977) studied a sample of the working population in the United States. Five job attributes were rank ordered as to importance (high pay, security, short hours, advancement, and feeling of accomplishments). The males and females ranked these attributes in the same order with no significant differences between the two genders. Mobley's study also contradicts Lawler's (1971) finding that females value pay less than men.

Tenure. Tenure has been found to be inversely related to employee turnover. This relationship is similar to the age and turnover relationship, and there is thought to be an interaction between age and tenure as predictors of turnover. Length of service was found to be the best single predictor of turnover in a study by Manigone (1973), with lower tenure yielding higher turnover. Mobley, Horner, and Hollingsworth (1978) reported a correlation of .35 between tenure and overall job satisfaction, -.35 with intention to quit, and -.25 with actual turnover. Waters, Roach, and Waters (1976) as well as Arnold and Feldman (1982) found an identical correlation of -.30 between tenure and turnover.

Causal Models of Turnover and Behavioral Intentions

Causal models of job satisfaction attempt to specify variables that are considered to be causally relevant or which in combination impact overall job satisfaction. While turnover research prior to the 1970s typically used one variable as a predictor, later models including Price (1977), Mobley et al. (1977), Martin (1979), and Bluedorn (1982) incorporated behavioral intentions as explanations of turnover.

Several studies (Fishbien & Ajzen, 1975; Kraut, 1975; Mobley, Horner, & Hollingsworth, 1978; Miller, Katerberg, & Hulin 1979) have treated behavioral intentions as psychological links to turnover. A person's intent to perform a specific behavior is the immediate determinant of the behavior (Fishbein & Ajzen, 1975). Kahle and Berman (1979) found that attitude has causal predominance over behaviors and that the knowledge of attitudes has a significant degree of predictive validity regarding behavior. Most withdrawal models have treated intention to quit as the final cognitive variable immediately before and having direct impact on turnover behavior (Mobley, 1977; Mobley, Griffeth, Hand, & Meglino, 1979). Therefore, turnover intentions have been integrated into heuristic models including those by Mobley (1977), and Mobley, Griffeth, Hand, and Meglino (1979).

A study of the turnover model presented by Mobley, Horner, and Hollingsworth (1977), resulted in a correlation of .49 between intent to leave and actual turnover. Newman (1974) found a .39 correlation between the intent to resign and actual quitting in a study of nursing home personnel. Manigone (1973) found that intentions were significantly related to turnover, as did Marsh and Mannari (1977) with a .13 correlation. Waters, Roach, and Waters (1976) likewise reported a .36 correlation. Hom, Katerberg, and Hulin (1979) found a .67 correlation between National Guard members' intention to reenlist and actual reenlistment. Bluedorn (1982) studied a sample of insurance company employees and reported a .28 correlation with intent to leave and turnover. Bluedorn also found a -.37 correlation between job satisfaction and intent to leave. Steel and Ovalle (1984) in their meta-analysis of intention to leave and turnover relationship research, found a weighted average correlation of 0.50 between the two variables. Steel, Hendrix, and Balogh (1990) reanalyzed and updated Steel and Ovalle's meta-analysis of turnover intentions and found a .48 correlation between intent to leave and turnover. Michaels and Spector (1982) tested the Mobley, Griffeth, Hand, and Meglino model in a study of 112 mental health facility employees. Intent to leave was found to have a .41 correlation with turnover. Williams and Hazer (1986) found a positive correlation (.37 and .29 in two samples) between intent to leave and turnover in a reanalysis of the data from Michaels and Spector (1982) and Bluedorn (1982).

Shore, Newton, and Thornton (1990) studied the relationship of satisfaction to turnover intentions in a group of 566 classified university employees. Results supported Williams and Hazer's findings with a correlation of -.343 between job satisfaction and turnover intentions.

Nicholson, Wall, and Lischeron (1977) recommended that the intention to quit attitude should be investigated rather than actual turnover behavior. From a practical standpoint, it makes sense to deal with the turnover intentions of present teachers to prevent turnover rather than to deal with turnover on a post hoc basis with former employees (Werbel & Bedeian, 1989).

Mobley (1977) presented the "intermediate linkages model" in which he theorized that linkages between job satisfaction and turnover behavior occurred in the following causal order: (1) Job dissatisfaction led to thoughts of quitting, (2) Evaluation of looking for another job, (3) Evaluation of alternatives, (4) Intent to quit.

Martin (1979) investigated a causal model of employee intention to stay or leave, adapting the questionnaire used by Price and Bluedorn (1977). Martin used path analysis and regressed the determinants against "intent to leave." Martin found the following causal relationships to be true: (1) The higher the level of satisfaction with pay, the less likely the employee will express an intent to leave. (2) The higher the level of integration the less likely the employee will express an intent to leave. (3) The higher the level of satisfaction with promotion the less likely the employee will express an intent to leave. (4) Employees with higher education will have greater intent to leave than employees with lower educational levels. (5) Younger employees will have a higher rate of intent to leave than older employees. (6) Employees with short lengths of service will have more intent to leave than employees with long lengths of service (tenure). (7) Data was found to be inconclusive on gender and marital status.

Bluedorn (1982) incorporated the overall job satisfaction linkage of the Price model and the linkages of the Mobley (1977) model. Bluedorn's resultant "unified model" used path analysis and multiple regression techniques. Demographic variables were also integrated into the framework as precursors of job satisfaction and the propensity to leave. Determinants producing the strongest direct paths expressed as beta weights were age, routinization of the job, job opportunity, length of employment, and intent to leave.

Methodology

Secondary VTE teachers who were members of the American Vocational Association (AVA) provided the unit of analysis for this study. The geographic area of the study was limited to the 48 contiguous United States. A systematic random sample of 970 subjects from the total membership population of approximately 18,920 secondary vocational teachers was extracted by computer. Using the 95% confidence level and an error range of 4%, the minimum sample size was determined to be 582 for maximum predictive power (Nunnery, 1971). Based on an expectation for participation of 60%, the sample size was increased to 970.

The two-page questionnaire, a personalized and hand-signed cover letter that explained the purpose of the study, and a self-addressed, stamped, return envelope were mailed to each vocational teacher selected for the study. Although the survey was anonymous with respect to findings, the return envelope was coded so that it could be matched to a master list of participants and then discarded. No attempt was made to match surveys with the name of the respondents. A reminder postcard was sent to those participants who did not respond to the initial request. No individual teacher or school system was identified in reporting the survey results.

Data collected during the study were grouped into four categories: demographic information, Job Descriptive Index (JDI) subscales, Brayfield and Rothe Index (BRI), and intent to leave questions. These areas formed the two-page questionnaire that was mailed on January 7, 1991 to 970 participants selected by an AVA computerized random sample. The sample included participants from the 48 contiguous United States and responses were received from all states. There were 489 usable responses received from the initial mailing. Follow-up postcards were mailed to non-respondents on February 20, 1991 which resulted in the return of 33 additional questionnaires for a total of 504. The 504 usable questionnaires represented a response rate of 52% of the total surveys mailed and a response rate of 87% of the 582 optimally desired for the study.

Hypotheses

This study examined the following null hypotheses:

Null Hypothesis 1: There is no statistically significant mean difference in overall job satisfaction between younger vocational teachers and older vocational teachers.

Null Hypothesis 2: There is no statistically significant relationship among the variables of age, tenure, education, wage earner status, gender and intent to leave the school organization.

Null Hypothesis 3: There is no statistically significant relationship among the variables of teaching, pay, supervisor, opportunity for promotion, coworker, and overall job satisfaction with intent to leave the school organization.

Null Hypothesis 4: There is no statistically significant relationship among the variables of teaching, pay, supervisor, opportunity for promotion, and coworkers with overall job satisfaction.

Instrumentation

The questionnaire consisted of four parts: (a) demographic/biographic information, (b) the Job Descriptive Index, (c) the BRI and (d) questions relating to the level of the respondents' intent to leave.

Demographic/Biographic Information, Part A

This section of the instrument sought information concerning teacher gender, age, and marital status. Work-related questions included tenure, wage earner status, and level of education.

Job Descriptive Index, Part B

The Job Descriptive Index (JDI) revised, copyright 1985, Bowling Green State University was used by permission as one measure of job satisfaction in this study. The JDI is a cumulative point adjective checklist that descriptive of a respondent's current job situation. Some examples of studies that have used the JDI are: Bartol, 1979; Futrell & Parasuraman, 1979; Herold & Leatherwood, 1985; Hom, Katerberg, & Hulin, 1979; Koch & Steers, 1978; Mowday & Boulain, 1974; Newman, 1974; Waters, and Roach & Waters, 197. These studies correlated turnover with job satisfaction.

Demonstrated predictive validity of the JDI was reported by Hulin (1968). Results showed that JDI mean job satisfaction scores were significantly lower for employee who terminated than those who remained with the organization.

The JDI is subdivided into five subscales to facilitate the measurement of five aspects of a worker's job satisfaction: satisfaction with work itself (teaching), satisfaction with pay, satisfaction with promotional opportunities, satisfaction with coworkers, and satisfaction with supervision. A Cronbach's Alpha of as high as .93 has been reported (Martin & Hunt, 1980).

The traditional response method for the JDI has consisted of three choices: yes, no, and "?". For the purpose of this study, a 5 point "Likert Scale" was used, ranging from strongly agree to strongly disagree.

Thus, a broader range of response was allowed and the same scale was used for part B and C of the instrument.

Brayfield and Rothe Index, Part C

Permission was obtained to include the Brayfield and Rothe Index (1951) as a measure of overall job satisfaction. The BRI has a reported reliability coefficient of .93 (Spencer, Steers and Mowday, 1983). The BRI has been used in other studies in which an overall or "global" measure of worker satisfaction was desired (Abelson, 1987; Mobley, Horner, and Hollingsworth, 1978; Spencer, Steers and Mowday, 1983). The index is composed of 18 general statements to which the respondent may indicate satisfaction by marking agree or strongly agree. Disagree and strongly disagree make up the other half, with the neutral response being undecided. A 5 point "Likert Scale" is used, with scoring weights for each item ranging from 1 to 5. Total possible scores range from 18 to 90 with 54 being the neutral point (Brayfield & Rothe, 1951).

Intent to Leave Rating Scale, Part D

In the last section, teachers' intention to leave the current teaching organization was measured by their response to four progressive statements relating to quitting. These statements were developed by Mobley (1977) and were later included in a simplified test of Mobley's model by Mobley, Horner, and Hollingsworth (1978). Thinking of quitting was measured by asking teachers to respond to: "I think about quitting my job...". Measurement of this response was on a 5 point scale ranging from never (1) to constantly (5). Intention to search was measured by asking teachers to respond to: "I intend to search for a job in another organization." Response ranged from very unlikely (1) to very certain (5).

The probability of finding an acceptable alternative was measured by asking teachers to respond to: "The probability of finding acceptable alternative employment is...". Measurement of this response was on a 5 point scale ranging from very unlikely (1) to very certain (5).

Intent to leave was measured by asking teachers to respond to: "I intend to leave my current school organization within the next 12 months." This response was also measured from unlikely (1) to very certain (5). The 12 month period was added by the investigator to place a reasonable frame of time for the benefit of the respondents

Data Analysis

Data collected from the respondents were initially reported in a descriptive manner. Means and standard deviations were listed for the demographic questions, the JDI subscales, the BRI, and the four intent questions in Part D.

One-way analysis of variance was used to calculate differences in means between groups. Three-way analysis of variance was used to determine the differences in means of three groups in a 2 x 2 x 2 fixed model.

Tests of statistical significance to determine rejection or acceptance of the null hypothesis were calculated at the .05 confidence level.

Paired contrasts were used for multiple comparisons. The Bonferroni inequality method was used to determine the critical value of alpha. This allowed multiple contrasts to be made without increasing the probability of Type I errors (Glass and Hopkins, 1984). The Bonferroni correction was determined by dividing the alpha level (.05) by the total possible number of contrasts.

Multiple regression analysis was used to provide an explanation of the relationships among dependent variables of intent to leave and overall job satisfaction. Multiple regression analysis also allowed the influences of other independent variables to be excluded so that the effect of a single variable could be made more certain.

Table 1 presents the demographic and work related data for the population sample utilized for this study. Male teachers (n = 205) composed 40.7% of the sample with female teachers (n = 299) being the majority at 59.3%. Teacher age 24-39 (n = 158) included 31.4% of the sample; age range 40-48 (n = 186) included 37%, and age range 49-73 (n = 160) comprised 26.8%.

Teachers having 0 to 5 years of tenure composed the largest group at 32.8% (n = 141); 18% (n = 113) had 6-10 years; 20.8% (n = 131) had 11-17 years; and 22.8% (n = 115) had 18-41 years of tenure. It was interesting to note that 50.8% of the sample had 10 or less years of tenure. Primary wage earners comprised 61.5% of the sample (n = 310) with 37.9% having secondary wage earner status (n = 191). With regard to educational level, 46.2% had earned a bachelor's degree or less (n = 233) while 53.8% had earned a master's degree or higher (n = 271).

Response to Job Satisfaction Indexes

Table 2 presents the possible score range, neutral score and mean for each satisfaction index. The JDI subscale scores that were greater than the neutral score indicated mean satisfaction, while scores less than the

Table 1

Demographic and Work Related Data for Respondents

Respondents	Frequency	Percent	Cum. Percent
Gender			
Male	205	40.7	40.7
Female	299	59.3	100.0
Age			
24-39	158	31.4	31.4
40-48	186	37.0	68.4
49-73	160	26.8	100.0
Years of employment (4 cases missing)			
0-5	141	28.2	28.2
6-10	113	18.0	50.8
11-17	131	20.8	75.0
18-41	115	22.8	100.0
Primary Wage Earner (3 cases missing)			
Yes	310	61.5	61.5
No	191	37.9	100.0
Marital Status			
Single	97	19.2	19.2
Married	407	80.8	100.0
Educational level			
Bachelor's or less	233	46.2	46.2
Master's or more	271	53.8	100.0

Table 2

Satisfaction Index Ranges and Means

Scale	Poss.Score Range	Neutral Score	Mean Score
JDI Teaching	13 to 65	39	44.608*
JDI Pay	11 to 55	33	32.468
JDI Supervision	16 to 80	48	58.748*
JDI Promotion	8 to 40	24	20.095
JDI Coworker	16 to 80	48	60.161*
BRI Overall	18 to 90	54	69.175*

*Mean score indicated satisfaction

neutral score indicated dissatisfaction. Respondent scores indicated satisfaction for teaching, supervision,and coworker subscales. Dissatisfaction was indicated for the pay and promotion subscales.

The BRI, with a neutral response of 54, was used to indicate overall job satisfaction. The mean for this index was 69.175 which indicated overall job satisfaction for the sample.

The final section of the questionnaire contained four intent questions designed to indicate participant attitude toward leaving the school organization. Table 3 contains descriptive data related to each question. Thinking of quitting was measured by asking teachers to respond to: "I think about quitting my job...".

Measurement of this response was on a progressive 5 point scale ranging from never (1) to constantly (5). The mean for this indicator was 2.385. Intention to search was measured by asking teachers to respond to: "I intend to search for a job in another organization". Response ranged from very unlikely (1) to very certain (5). The mean for this indicator was 2.067. The probability of finding acceptable alternatives was measured by asking teachers to respond to: "The probability of finding acceptable alternative employment...".Measurement of this response was on a 5 point scale ranging from very unlikely (1) to very certain (5). The mean for this indicator was 2.778. Intent to leave was measured by asking teachers to respond to: "I intend to leave my current school organization within the next 12 months". This response

Table 3

Data for Attitude Toward Leaving Responses

Question	Mean	Median	Mode
Thinking of Quitting	2.385	2.0	2.0
Intent to Search	2.067	2.0	1.0
Acceptable Alternatives	2.778	3.0	1.0
Intent to Leave in 12 months	1.639	1.0	1.0

ranged from very unlikely (1) to very certain (5). Mean response was 1.639 for this indicator.

Findings Related to the Hypotheses

A reference to each hypothesis will be presented in this section, followed by a summary of the statistics used to accept or reject the null hypothesis and an explanation of the findings. Table 4 presents test results of the null hypotheses.

Table 4 Hypotheses Testing (Alpha level .05)

Hypotheses	Test Results
Ho_1	Rejected
Ho_2	Rejected
Ho_3	Rejected
Ho_4	Rejected

Null Hypothesis (HO_1)

A one-way ANOVA was performed to compare three age categories (group one: 24-39 years, group two: 40-48 years, group three: 49-73 years) with the dependent variable of overall job satisfaction as measured by the BRI. The null was rejected and a significant difference was found at the .05 alpha level (F = 6.3583, p = .0019, df = 2, 500). The Bonferroni correction yielded a .05166 value for alpha (pooled variance estimate).

Table 5 presents job satisfaction data with regard to age. Respondents in group one [age 24-39 years (n = 158)] with a mean of 67.7722 were the least satisfied among the three groups. Group two respondents [age 40-48 years\(n = 186)] had a mean of 68.6237 and were more satisfied than the younger group. Group three respondents [age 49-73 years (n = 159)] with a mean of 71.2264 was the most satisfied group. Use of paired contrasts revealed a significant difference between group one and three and also between group two and three.

Null Hypothesis (HO_2)

A one-way ANOVA was performed to compare three age categories (group one: 24-39, group two: 40-48, group three: 49-73) with the dependent variable of "intent to leave". The null hypothesis was rejected and a significant difference was found at the .05 alpha level (F= 3.0707, p = .0473, df = 503). The Bonferroni correction yielded a .0166 value for alpha. This critical value may be used to compare with the "probability" section of the pooled variance estimate (see Table 6).

Table 5

Age variable by B/R Index: One-Way ANOVA

Source	D.F.	S.S.	M.S.	F	Prob.
Between Grps	2	1036.5942	518.2971	6.3583	.0019
Within Grps	500	40757.3024	81.5146		
Total	502	41793.8966			

Group	N	Mean	S.D.	S.E.	95% C.I.
1	158	67.7722	10.2335	.8141	66.1641 to 69.3802
2	186	68.6237	8.3807	.6145	67.4113 to 69.8360
3	159	71.2264	8.4651	.6713	69.9005 to 72.5523
Total	503	69.1789	9.1244	.4068	68.3796 to 69.9782

Contrast Coefficient Matrix

	Grp 1	Grp 2	Grp 3
Contrast 1	1.0	-1.0	0.0
Contrast 2	1.0	0.0	-1.0
Contrast 2	0.0	1.0	-1.0

Pooled Variance Estimate

Table 5 (Continued)

	Value	S.E.	t	D.F.	Prob.
Contrast 1	-0.8515	0.9768	-0.872	500.0	0.384
Contrast 2	-3.4543	1.0142	-3.406	500.0	0.001
Contrast 3	-2.6028	0.9752	-2.669	500.0	0.008

Bonferroni correction for alpha = .0166

Table 6

Age variable by Intent to Leave: One-Way ANOVA (N = 503)

Source	D.F.	S.S.	M.S.	F	F Prob.
Between Grps	2	7.3271	3.6636	3.0707	.0473
Within Grps	500	596.5417	1.1931		
Total	502	603.8688			

Group	N	Mean	S.D.	S.E.	95% C. I.
1	158	1.8101	1.1463	.0912	1.6300 to 1.9903
2	186	1.5215	.9654	.0708	1.3819 to 1.6612
3	159	1.6101	1.1742	.0931	1.4261 to 1.7940
Total	503	1.6402	1.0968	.0489	1.5441 to 1.7362

Table 6 (Continued)

Contrast Coefficient Matrix

	Grp 1	Grp 2	Grp 3
Contrast 1	1.0	-1.0	0.0
Contrast 2	1.0	0.0	-1.0
Contrast 3	0.0	1.0	-1.0

Pooled Variance Estimate

	Value	S.E.	_t_	D.F.	Prob.
Contrast 1	0.2886	0.1182	2.442	500.0	0.015
Contrast 2	0.2001	0.1227	1.631	500.0	0.104
Contrast 3	-0.0886	0.1180	-0.751	500.0	0.453

Bonferroni correction for alpha = .0166

The respondents in group one [age 24-39 years (_n_ = 158), Mean = .8101] revealed the greatest intent to leave. Group two [age 40-48 years (_n_ = 186)] had the smallest mean. Group three respondents [age 49-73 years (_n_ = 159)] had a mean of 1.6101. Using paired contrasts, a significant difference was found between group one and group two. Therefore, the null hypothesis regarding age was rejected.

A one-way ANOVA was performed to compare the relationship of four employment tenure categories to intent to leave: group one (0-5 years), group two (6-10 years), group three (11-17 years) and group four (18-41 years). For this test, F = 5.2993, p = .0013, and df = 3, 496. The Bonferroni correction yielded a critical value of .0083 for alpha (pooled variance estimate). ANOVA results for these variables are contained in table 7.

As shown in Table 7 group two respondents (n = 113, Mean = 1.8496) revealed the greatest intent to leave, followed by group one (n = 141, Mean = 1.8014). Group three respondents (n = 121) with a mean of 1.5041 ranked third, and group four (n = 125) had the lowest intent to leave with a mean of 1.3920. Respondent comments on the questionnaire indicated that the group four mean would have been even lower if leaving due to retirement had been a distinguishing factor. Paired contrasts revealed a statistically significant difference between group one and group four (probability of .002) as well as group two and group four (probability of .001). Both of these values were significant as related to the critical alpha value of .0083 calculated by the Bonferroni method. Therefore the null was rejected with regard to tenure.

Table 7

Tenure by Intent to Leave: One-Way ANOVA (N = 499)

Source	D.F.	S.S.	M.S.	F	Prob.
Between Grps	3	18.5559	6.1853	5.2993	.0013
Within Grps	496	578.9221	1.1672		
Total	499	597.4780			

Group	N	Mean	S.D.	S.E.	95% C.I.
1	141	1.8014	1.0903	.0918	1.6199 to 1.9830
2	113	1.8496	1.3108	.1233	1.6052 to 2.0939
3	121	1.5041	.9410	.0855	1.3348 to 1.6735
4	125	1.3920	.9580	.0857	1.2224 to 1.5616
Total	500	1.6380	1.0942	.0489	1.5419 to 1.7341

Contrast Coefficient Matrix

	Grp 1	Grp 2	Grp 3	Grp 4
Contrast 1	1.0	-1.0	0.0	0.0
Contrast 2	1.0	0.0	-1.0	0.0
Contrast 3	1.0	0.0	0.0	-1.0
Contrast 4	0.0	1.0	-1.0	0.0
Contrast 5	0.0	1.0	0.0	-1.0
Contrast 6	0.0	0.0	1.0	-1.0

Table 7 (Continued)

Pooled Variance Estimate

	Value	S.E.	t	D.F.	Prob.
Contrast 1	-0.0481	0.1364	-0.353	496.0	0.724
Contrast 2	0.2973	0.1339	2.221	496.0	0.027
Contrast 3	0.4094	0.1327	3.085	496.0	0.002
Contrast 4	0.3454	0.1413	2.444	496.0	0.015
Contrast 5	0.4576	0.1402	3.263	496.0	0.001
Contrast 6	0.1121	0.1378	0.814	496.0	0.416

Bonferroni correction for alpha = .0083

A three-way ANOVA was performed to compare the independent variables of primary wage earner, sex, and educational level to intent to leave. Wide variation was found among groups; for example n = 7 males who were not primary wage earners and who held a bachelor's degree or less, and n = 10 males who were not primary wage earners and who held master's degrees or higher. This was contrasted by n = 90 males who were primary wage earners with lower education and n = 78 females with higher education who were primary wage earners. No statistically significant main effects or interactions were found, therefore the null hypothesis was not rejected regarding these variables.

Null Hypothesis (HO_3)

Multiple regression analysis was performed on the intent to leave variable and the following dependent variables: JDI teaching, coworkers, pay, promotion, supervision, and BRI satisfaction. Multiple regression data for these variables are reported in Table 8. R square was .17178, the adjusted R square (which penalizes the data for chance correlations) was .16178, the standard error was .99594, and F was found to equal

17.11158. (N = 502 for this sample). The Bonferroni correction yielded a critical value of .0033 for alpha.

Two independent variables were found to have significant power to predict intent to leave: the BRI with a probability of .0001 and the JDI coworker subscale with a probability of .0014.

Table 8

Job Satisfaction Indexes with Intent to Leave (N = 502)

Scale	Mean	S. D.
Teaching	44.631	6.668
Pay	32.494	7.606
Supervision	58.755	11.973
Promotion	20.090	5.724
Coworkers	60.151	9.610
Brayfield/Rothe	69.207	9.102
Intent to leave	1.631	1.088

Scale	Pay	Super	Promo	Cowork	BRI	Intent to Leave
Teaching	.229	.347	.278	.281	.705	-.242
Pay		.116	.349	.173	.272	-.202
Supervision			.376	.302	.379	-.243
Promotion				.252	.293	-.184
Coworkers					.251	-.246
Brayfield/Rothe						-.358

Table 8 (Continued)

Multiple R	.41447	Analysis of Variance			
R Square	.17178		DF	S.S.	M.S.
Adjusted R Sq.	.16174	Reg.	6	101.83689	16.97281
Standard Error	.99594	Res.	495	490.98582	.99189
		F = 17.11158		Probability = .0001	

Variable	B	SE B	Beta	t	Prob.
BRI	-.037003	.007136	-.309611	-5.185	.0001
Coworker	-.016073	.005010	-.141999	-3.208	.0014
Pay	-.013693	.006399	-.095744	-2.140	.0328
Promotion	-.001909	.008999	-.010044	-0.212	.8321
Super	-.008456	.004313	-.093066	-1.960	.0505
Teaching	.011978	.009582	.073424	1.250	.2119
(Constant)	5.604710	.410052		13.688	.0001

Bonferroni Correction for alpha = .0033

Null Hypothesis (HO_4)

Table 9 contains the multiple regression analysis results for the dependent variable of overall satisfaction and the following independent variables: JDI coworkers, pay, supervision, teaching and promotion. R square was .53072, adjusted R square was .52599, standard error was 6.26630, and *F* was found to equal 112.18825 (*N* = 502 for this sample). The Bonferroni correction yielded a critical value of .005 for alpha.

Three independent variables were found to have significant coefficients with respect to predicting overall job satisfaction: the JDI pay satisfaction subscale with a probability of .0025, the JDI supervision satisfaction subscale with a probability of .0001, and JDI teaching satisfaction subscale with a probability of .0001.

Table 9

JDI and Brayfield/Rothe Index (N = 502)

Scale	Mean	Std. Dev.
Teaching	44.631	6.668
Pay	32.494	7.606
Supervision	58.755	11.973
Promotion	20.090	5.724
Coworkers	60.151	9.610
Brayfield/Rothe	69.207	9.102

Scale	Pay	Super	Promo	Cowork	BRI
Teaching	.229	.347	.278	.281	.705
Pay		.116	.349	.173	.272
Supervision			.376	.302	.379
Promotion				.252	.293
Coworkers					.251

			Analysis of Variance		
Multiple R	.72851		DF	S.S.	M.S.
R Square	.53072	Reg.	5	22026.236	4405.247
Adjusted R Sq.	.52599	Res.	496	19476.217	39.266
Std Error	6.26630				

F = 112.18825 Prob. = .0001

Table 9 (Continued)

Variable	B	SE B	Beta	t	Prob.
Coworker	.008715	-.031518	.009202	0.277	.7823
Pay	.121374	-.039889	.101426	3.043	.0025
Super	.104224	-.026733	.137101	3.899	.0001
Teaching	.851441	-.046620	.623770	18.264	.0001
Promotion	.047596	-.056579	.029934	0.841	.4066
(Const.)	19.658079	.424302		8.109	.0000

Bonferroni correction for alpha = .005

Findings Related to the Hypotheses

Null Hypothesis 1. Respondent age in years was divided into three categorical variables to facilitate measurement of this data: group one: 24-39, group two 40-48, and group three 49-73. A statistically significant difference was found between group one and three as well as between group two and three. Therefore, the null was rejected. The youngest group of respondents were the least satisfied, the middle age group more satisfied, and the oldest age group was the most satisfied. This was consistent with the findings of Williams and Hazer (1986), Janson and Martin (1982), and Liou, Sylvia, and Brunk (1990) who found a positive correlation between age and satisfaction.

Null Hypothesis 2. The age of the respondent was divided into three categorical variables to facilitate measurement of these data: group one: 24-39, group two 40-48, and group three 49-73. A statistically significant difference between group one and two was noted. Therefore, the null was rejected with regard to age. The result that the youngest age group reported the greatest intent to leave was consistent with the literature (Farris, 1971; Federico, Federico, & Lundquist, 1976; Stone & Athelstan, 1969; Pontius, 1982; and Waters, Roach, & Waters, 1976). The data which indicated the oldest group had a greater intent to leave than the middle age group was not expected by the researchers and not supported by the previously cited studies. The data for the oldest age group however, included those respondents who planned to retire within 12 months. This factor was not allowed for in the design of the questionnaire.

Respondent tenure in years was divided into four categorical variables: group one 0-5, group two 6-10, group three 11-17, and group four 18-41. A statistically significant difference was found between group one and four as well as between group two and four. The null was therefore rejected with regard to tenure. Group two respondents, with 6-10 years of tenure, reported the greatest intent to leave, with the lowest tenured teachers second. Teachers in group three and group four, respectively, had the most tenure and reported the least intent to leave. Respondent comments written on the margins of the questionnaire caused the researchers to believe that an even lower intent to leave score would have been indicated if leaving due to retirement had been excluded in this data. While the literature indicated that tenure is inversely correlated to turnover (Arnold & Feldman, 1982; Graham, 1982; Manigone, 1973; Mobley, Horner, & Hollingsworth, 1978; and Waters, Roach, & Waters, 1976), the literature did not support the results found for group two.

The null hypothesis was not rejected for wage earner status, sex, and education. Thus, concerning wage earner status, the data supported the findings of Waters, Roach, and Waters (1976) and did not agree with the findings of Federico, Federico, and Lundquist, (1976) and Manigone, (1973). The finding of no correlation related to gender generally supported the literature in that mixed findings predominate. This set of mixed findings may be attributed to the difficulty in isolating other variables which may interact. The lack of correlation with education was similar to the finding of Hellriegel and White (1973), but differed with the findings of Federico et al. who reported that workers with higher education had higher turnover rates.

Null Hypothesis 3. The two independent variables of job satisfaction as measured on the BRI and the JDI index of coworker satisfaction were found to have statistically significant power to predict intent to leave. The null was therefore rejected. The finding of a negative correlation between satisfaction and intent to leave was well supported by the literature including studies by Hulin (1966), Muchinsky and Tuttle (1979), Nicholson, Wall, and Lischeron (1977), Manigone (1973), Porter, Steers, Mowday, and Boulian (1974).

The finding of a negative correlation between satisfaction with coworkers and intent to leave was also supported by the literature (Hellriegel & White, 1973; Kraut, 1975; Koch & Steers, 1978; and Mobley, Horner, & Hollingsworth, 1978). While other studies have not reported coworker satisfaction to be a strong predictor, the findings of this study were supported.

The lack of a significant correlation with supervision satisfaction as a predictor was also found by Mobley, Horner, and Hollingsworth, (1978); Newman, (1974); and Waters, Roach, and Waters (1976). As previously discussed, there have been mixed findings related to gender and educational level as predictors of turnover. Satisfaction with work itself (teaching) was not found to correlate with intent to leave. This finding was supported in the literature by Newman (1974). Other studies found a negative correlation between satisfaction on this JDI subscale and leaving. The lack of relationship found between pay and intent to leave was supported by the findings of Koch and Steers (1978), Newman (1974), Kraut (1975) and Waters, Roach, and Waters (1976). Lack of significant findings related to promotion opportunity was also shared by Koch and Steers (1978) and Newman (1974).

Null Hypothesis 4. The three independent variables of job satisfaction as measured on the JDI index were found to have statistically significant power to predict overall satisfaction as measured on the BRI: pay, supervision, and teaching. The null was therefore rejected. The positive correlation of pay with satisfaction in this study was shared by Hellriegel and White (1973); Mobley, Horner, and Hollingsworth (1978); Hom, Katerberg, and Hulin (1979) and Liou, Sylvia, and Brunk (1990). This finding did not support Herzberg's (1967) explanation that salary was a "dissatisfier" according to the definition of "satisfaction" used in this study.

Supervision satisfaction as a predictor of overall job satisfaction, while not strong, was also supported in the literature. Parsons, Herold, and Leatherwood (1985) reached a similar finding as well as Liou, Sylvia, and Brunk (1990). The latter study while not statistically significant in this finding was positively weighted. This finding did not support Herzberg's (1967) explanation that supervision was a "dissatisfier" according to the definition of "satisfaction" used in this study. Satisfaction with the work itself as being a predictor of overall satisfaction was supported by the findings of Waters and Roach (1973) and Waters, Roach, and Waters (1976).

The lack of a statistically significant correlation between coworker satisfaction and overall satisfaction was also found by Manigone (1973), Waters, Roach, and Waters (1976), and Ilgen and Dugoni (1977). The findings of this study were not, however supported by Mobley, Horner, and Hollingsworth (1978) and Hom, Katerberg, and Hulin (1979) both of which found a positive relationship.

The lack of a statistically significant correlation between promotion satisfaction and overall satisfaction was also found by Koch and Steers (1978) and Newman (1974). However, other studies did find a positive relationship including those by Mobley, Horner, and Hollingsworth (1978) and Hom, Katerberg, and Hulin (1979). Comments written in the margins of the questionnaire by some respondents indicated that there was no possibility of promotion due to possession of a baccalaureate level or lower teaching certificate, or that no further opportunity was perceived to exist.

Conclusions

Based on the interpretation of the findings of this study, the researchers have drawn the following conclusions:

(1) Respondents may consider this to be a poor time to enter or reenter the labor pool outside the education field because of the current economic recession. Only 4.2% of the respondents indicated that their intent to leave was likely or very likely. This would represent an extremely low turnover rate since research has shown a .48 to.50 correlation between intent to leave and turnover (Steel, Hendrix, & Balogh, 1990; Steel & Ovalle, 1984).

(2). Although intent to leave is low (4.2%) over 33% of the teachers perceived that the probability of finding suitable alternative employment was certain or very certain. The option of entry into an alternate career is an option that many academic teachers would not have available. This may lead VTE teachers to score higher satisfaction scores since they do perceive a career option and probably have outside work experience for the basis of comparison.

(3). Although satisfaction with pay is a predictor of overall job satisfaction, it is not a predictor of intent to leave. This finding is contrary to the general idea that teachers are lost to business and industry because of pay inequity. The results of this study disagree with the findings of Carrell and Dittrich (1976) who reported that pay level relative to others outside the organization was a particularly strong predictor of turnover. VTE teachers therefore accept the fact that they can produce more income by working in the occupation of their expertise rather than preparing their students, although they indicate dissatisfaction with pay level. The findings of this study also disagree with Pontius (1982) who studied industrial educators and found a significant rate of turnover due to the higher salaries offered by business and industry.

REFERENCES

Abelson, M.A. (1987). Examination of avoidable and unavoidable turnover. Journal of Applied Psychology, 72(3), 382-386.

Adler, S. (1980). Self-esteem and causal attributions for job satisfaction and dissatisfaction. Journal of Applied Psychology, 65, 327-332.

Arnold, H.J. and Feldman, D.C. (1982). A multivariate analysis of the determinants of job turnover. Journal of Applied Psychology, 67(3), 350-360.

Bartol, K.M. and Wortman, M.S. (1976). Sex effects in leader behavior, self-descriptions and job satisfaction. Journal of Psychology, 94, 177-183.

Bluedorn, A.C. (1982). A unified model of turnover from organizations. Human Relations, 35(2), 135-153.

Brayfield, A.A. & Rothe, H.F. (1951). An index of job satisfaction. Journal of Applied Psychology, 35, 307-311.

Busch, P., & Bush, R.F. (1978). Women contrasted to men in the industrial sales force: Job satisfaction, values, role clarity, performance, and propensity to leave. Journal of Marketing Research, 15, 438-448.

Carrell, M.R. and Dittrich, J.E. (1976). Employee perceptions of fair treatment. Personnel Journal, 55, 523-524.

Carrell, M.R., & Elbert, N.F. (1974). Some personal and organizational determinants of job satisfaction of postal clerks. Academy of Management Journal, 17, 368-373.

Cobern, M., & Conlon, N. (1980). Occupational mobility of scientists and engineers. (Special report to NSF 80-317). (ERIC Document Reproduction Service No. ED 196 717).

Farris, G.G. (1971). A predictive study of turnover. Personnel Psychology, 24, 311-328.

Federico, S.M., Federico, P.A., & Lundquist, G.W. (1976). Predicting women's turnover as a function of extent of met salary expectations and biodemographic data. Personnel Psychology, 29, 559-566.

Fishbein, M., and Ajzen, I. (1975). Belief, attitudes, intention, and behavior. Reading, Mass.: Addison-Wesley.

Finn, R.H. and Lee, S.M. (1972). Salary equity: Its determination, analysis, and correlates. Journal of Applied Psychology, 56, 283-292.

Froechlich, L.H. (1966). Factors related to the tendency of Iowa State University agricultural education graduates to not enter or leave the vocational agriculture teaching profession (Report No. 17). Ames: Iowa State University, Agriculture Education.

Furey, R. and Lauroesch, W. (1986). Retention of career teachers. _The High School Journal_, 69(4), 245-247.

Futrell, C.M. and Parasuraman, A. (1984). The relationship of satisfaction and performance to salesforce turnover. _Journal of Marketing_, _48_(4), 33-40.

Glass, G.V. and Hopkins, K.D. (1984). _Statistical methods in education and psychology_ (2). New Jersey: Prentice-Hall.

Graham, S.L. (1982). Locus of control and employment in law enforcement (Doctoral dissertation, Duke University, 1981). _Dissertation Abstracts International_, _42_, 3126A.

Hellreigel, D., & White,G.E. (1973). Turnover of professionals in public accounting: A comparative analysis. _Personnel Psychology_, _26_, 239-249.

Herzberg, F. (1967). The motivation to work. In E.A. Fleishman (Ed.) _Studies in personnel and industrial psychology_. Homewood, Illinois: Dorsey Press.

Hom, P.W., Katerberg, R., and Hulin, C.L. (1979). Comparative examination of three approaches to the prediction of turnover. _Journal of Applied Psychology_, _64_ (3), 280-290.

Homans, G.C. (1953). _The human group_. New York: Harcourt, Brace and World.

Horner, D.L. (1982). The relationship of job satisfaction to values consensus of an organization and its members (Doctoral dissertation, Southern Illinois University at Carbondale, 1981). Dissertation Abstracts International,42, 4228A.

Hulin, C.L. (1966). Job satisfaction and turnover in female clerical population. Journal of Applied Psychology, 50, 280-285.

Hulin, C.L. and Smith, P.C. (1976). Sex differences in job satisfaction. In M. Gruneberg (Ed.) Job satisfaction--a reader. New York: John Wiley.

Ilgen, D.R., & Dugoni, B.L. (1977). Initial orientation to the organization: Its impact on psychological processes associated with the adjustment of new employees. Kissimmee, Fla.: Academy of Management.

Janson, and Martin, (1982). Job satisfaction and age. Social Forces, 60, 1089-1102.

Kahle, L.P. and Berman, J.M. (1979). Attitudes cause behavior: A cross lagged panel analysis. Journal of Personality and Social Psychology, 37, 315-321.

Keavney, T., Jackson, J. and Fossum, J. (1976). Sex differences in job satisfaction. Research paper no. 116, University of Wyoming.

Kemper, T.D. and Reichler, M.L. (1976). Work integration, marital satisfaction and conjugal power. Human Relations, 29, 929-944.

Knowles, M.C. (1964). Personal and job factors affecting labor turnover. Personnel Practice Bulletin, 20, 25-37.

Koch, J.L. and Steers, R.M. (1978). Job attachment, satisfaction, and turnover among public sector employees. Journal of Vocational Behavior, 12, 119-128.

Kraut, A.I. (1975). Predicting turnover of employees from measured job attitudes. Organizational Behavior and Human Performance, 13, 233-243.

Lawler, E.E. (1971). Pay and organizational effectiveness: a psychological view. New York: McGraw Hill.

Liou, K., Sylvia, R.D., & Brunk, G. (1990). Non-work factors and job satisfaction revisited. Human Relations, 43(1), 77-86.

Manigone, T.W. (1973). Turnover-Some psychological and demographic correlates. In R.P. Quinn & T.W. Manigone (Eds.), The 1969-1970 survey of working conditions. Ann Arbor: University of Michigan, Survey Research Center, 1973.

Marsh, R., & Mannari, H. (1977). Organizational commitment and turnover: A predictive study. Administrative Science Quarterly, 22, 57-75.

Martin, T.N. (1979). A contextual model of employee turnover intentions. Academy of Management journal, 22, 313-324.

Martin, T.N., & Hunt, J.G. (1980). Social influence and intent to leave: A path-analytic process model. Personnel psychology, 33, 505-528.

Meyer, C.K., Beville, M.J., Magedanz, T.C., & Hackert, A.M.(1979). South Dakota state government employee turnover and work related attitude: An analysis and recommendation. Midwest Review of Public Administration, 13, 88-118.

Michaels, C.E., and Spector, P.E. (1982). Causes of employee turnover: A test of the Mobley, Griffeth, Hand, and Meglino Model. Journal of Applied Psychology, 67(1), 53-59.

Miller, H.E., Katerberg, R., and Hulin, C.L. (1979). Evaluation of the Mobley, Horner, and Hollingsworth Model of employee turnover. Journal of Applied Psychology, 64(5), 509-517.

Mobley, W.H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover. Journal of Applied Psychology, 62(2), 237-240.

Mobley, W.H. (1982). Some unanswered questions in turnover and withdrawal research. Academy of Management Review, 7(1), 111-116.

Mobley, W.H., Griffeth, R.W., Hand, H.H., and Meglino, B.M.(1979). Review and conceptual analysis of the employee turnover process. Psychological Bulletin, 86(3), 493-522.

Mobley, W.H., Horner, S.O., and Hollingsworth, A.T. (1978). An evaluation of precursors of hospital employee turnover. Journal of Applied Psychology, 63(4), 408-414.

Muchinsky, P.M., & Tuttle, M.L. (1979). Employee turnover: An empirical and methodological assessment. Journal of Vocational Behavior, 14, 43-77.

Newman, J.E. (1974). Predicting absenteeism and turnover: A field comparison of Fishbein's model and traditional job attitude measures. Journal of Applied Psychology, 59, 610-615.

Nicholson, N., Wall, T., & Lischeron, J. (1977). The predictability of absence and propensity to leave from employees' job satisfaction and attitudes toward influence in decision-making. Human Relations, 30, 499-514.

Nunnery, M. Y. (1971). *Power, polls, and school elections*. Berkeley: McCutchan.

Parsons, C.K., Herold, D.M. and Leatherwood, M.L.(1985). Turnover during initial employment: A longitudinal study of the role of causal attributions. *Journal of Applied Psychology, 70*(2), 337-341.

Phillips, D.J. (1990). The price tag on turnover. *Personnel Journal*, *69*(12), 58-61.

Pontius, D.R. (1982). An analysis of the causes and results of position changes by industrial educators (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1981). *Dissertation Abstracts International, 42*, 3041A.

Porter, L.W., and Steers, R.M. (1973). Organizational, work, and personal factors in employee turnover and absenteeism. *Psychological Bulletin*, *80*(2), 151-176.

Porter, L.W., Steers, R.M., Mowday, R.T., and Boulain, P.V.(1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology*, *59*, 603-609.

Price, J.L. (1977). The study of turnover. Ames, Iowa: The Iowa State University Press. Price, J.L., & Bluedorn, A.C. (1977). Intent to leave as a measure of turnover. Paper presented at the annual meeting of the 37th National academy of management. Orlando Florida. As cited by Martin, T.N., & Hunt J.G.(1980). Social influence and intent to leave: A path-analytic process model. Personnel Psychology, 33.

Quinn, R.P., & Baldi de Mandilovith, M.S. (1977). Education & job satisfaction: A questionable payoff. (NIE Papers in Education & Work: Number 5). Ann Arbor Michigan: Survey Research Center, University of Michigan.

Robinson, B.E. (1979). Prediction of clerical turnover in banks by means of a weighted application blank. Journal of Applied Psychology, 56, 282.

Rusbult, C.E., & Farrell, D. (1983). A longitudinal test of the investment model: The impact on job satisfaction, job commitment, and turnover of variations in rewards, costs, alternatives and investments. Journal of Applied Psychology, 68, 429-438.

Shore, L.M., Newton, L.A., & Thornton, G.C. (1990). Job and organizational attitudes in relation to employee behavioral intentions. *Journal of Organizational Behavior*, *11*, 57-67.

Silber, B. B.(1982). A multivariate model of employee turnover (Doctoral dissertation, Memphis State University, 1982). *Dissertation Abstracts International*, *43*, 2030-2031B.

Smith, A. and Plant, A. (1982). Sex differences in job satisfaction. *Journal of Applied Psychology*, *67*, 249-251.

Smith, P.C., Kendall, L.M., and Hulin, C.L. (1969). *The measurement of satisfaction in work and retirement.* Chicago: Rand McNalley.

Spencer, D.G., Steers, R.M., and Mowday, R.T. (1983). An empirical test of the inclusion of job search linkages into Mobley's model of the turnover decision process. *Journal of Occupational Psychology*, 56(2), 137-144.

Steel, R.P., Hendrix, W.H., & Balogh, S.P. (1990). Confounding effects of the turnover base rate on relations between time lag and turnover study outcomes: An extension of meta-analysis findings and conclusions. *Journal of Organizational Behavior*, *11*, 237-242.

Steel, R.P., & Ovalle, N.K. (1984). A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. Journal of Applied Psychology, 69(4), 673-686.

Stone, T.H., and Athelstan, G.T. (1969). The SVIB for women and demographic variables in prediction of occupational tenure. Journal of Applied Psychology, 53, 408-412.

Waters, L.K., & Roach, D. (1973). Job attitudes as predictors of termination and absenteeism: Consistency over time and across organizational units. Journal of Applied Psychology, 57, 341-342.

Waters, L.K., Roach, D., and Waters, C.W. (1976). Estimates of future tenure, satisfaction, and biographical variables as predictors of termination. Personnel Psychology, 29, 57-60.

Werbel, J.D., & Bedeian, A. G. (1989). Intended turnover as a function of age and job performance. Journal of Organizational Behavior, 10, 275-281.

Wild, R., & Dawson, J.A. (1972). The relationship of specific job attitudes with overall job satisfaction and the influence of biographical variables. Journal of Management Studies, 9, 150-157.

Williams, L.J. and Hazer, J.T. (1986). Antecedents and consequences of satisfaction and commitment in turnover models: A reanalysis using latent variable structural equation methods. Journal of Applied Psychology, 71(2), 219-231.

Zietz, G. (1990). Age and work satisfaction in a government agency: A situational perspective. Human Relations, 43(5), 419-438.

Notes

1. The Job Descriptive Index was obtained from the Department of Psychology, Bowling Green State University, Bowling Green, Ohio 43403 for a cost of $407.00.

Perception of Louisiana Dislocated Homemaker Center Directors and Clients

James W. Trott, Jr., Associate Dean
College of Agriculture

Michael F. Burnett, Interim Dean
School of Vocational Education

Mark Holden, Graduate Assistant
School of Vocational Education

Louisiana State University
Baton Rouge, Louisiana

A Comparison of the Perceptions of Displaced Homemaker Program Clients and Administrators in Louisiana.

Introduction and Statement of the Problem

The Displaced Homemaker Program began with the passage of the California Homemaker Act, in September, 1975. A network of centers quickly developed around the country and in 1979, the 95th Congress passed the Displaced Homemaker Act (H.R. 28) sponsored by senator Yvonne Burke of California. In 1977, Act 664 of the Louisiana Legislature, authorized the funding of a pilot program to serve the needs of displaced homemakers in Louisiana. The initial center site was in New Orleans under the Bureau for Women and was supported with federal vocational education funds. In 1979, state funds were appropriated to the Division of Vocational Education, Louisiana State Department of Education to establish a network of displaced homemaker centers. By FY 1984-85 the network had grown to the present seven centers serving 2002 clients. Although the number of clients was significant, little was known about the client population and how well the center programs were perceived to be meeting client needs. The problem to be examined by this study was, therefore, twofold: (1) To profile the displaced homemaker client in Louisiana, and (2) To determine the degree to which current center programs were perceived to be meeting client needs. It is to the latter of the two that this presentation has addressed itself.

Theoretical/conceptual basis and related literature

The conceptual basis for this work rests in the principles of program evaluation and improvement. Programming such as provided by the displaced homemaker centers, particularly if it is ongoing, should be evaluated to determine program effectiveness in meeting stated purposes and client needs. One way to determine program effectiveness is to examine the perceptions of those served and those providing services.

Guidelines for establishing displaced homemaker programs in vocational-technical systems have been developed (Eastes, 1980; Educational Development Center, 1980; Kirchmeir, 1979; Musickant, 1982; Peltier, 1981; Towns et al., 1980, and Zendell, 1981). forsythe (1978) profiled examples of programs for displaced homemakers offered in the community college setting while Fleming and Malone (1980) and Luttrell (1982) described private programs designed to offer assistance to displaced homemakers. Dahlberg (1983) provided an overview of the problems faced by displaced homemakers and some of the avenues through which such individuals can be assisted by displaced homemaker programs.

A number of studies have been conducted to examine the problems and needs of displaced homemakers (Arnold & Marzone, 1981; Elhardt & Elhardt, 1979; Hixon, 1980; Le & Smiley, 1981; Vinick & Jacobs, 1980; Woods, 1978). These studies identified needs relating to skills deficiencies, self-confidence, recent paid work experience, training or education for employment, child care, transportation, and emotional problems. A study by the Far West Laboratory for Educational Research and Development (1982) found the seven most frequently identified needs of the displaced homemaker to be: (1) personal counseling; (2) career and vocational counseling; (3) further education; (4) information, outreach, and publicity; (5) temporary financial or other support during training; (6) jobs and/or job development; and, (7) awareness of own needs, specifically developing self-confidence, assertiveness, and in overcoming emotional problems.

Studies have also been conducted to provide a demographic profile of the displaced homemaker (Bromley (1982); Dimon (1980); Lisack (1979); Zawada (1980). Bromley's work characterized the typical displaced homemaker as a white female over 25 years of age interested in securing employment and who needed assistance finding a job, acquiring support skills, locating career information, and gaining self-confidence. Zawada noted that the problems of today's displaced homemaker tended to overlap with those of women in the 1960's.

Research Methods and Procedures

The sample for the study was a stratified random sample of 151 clients from the active mailing list of 1,300 clients from the seven Louisiana displaced homemaker centers. The mailing list is maintained by the state office with responsibility for overseeing statewide programming and reflected all of the clients served by the seven centers. To ensure adequate representation from each center, the proportion of clients each center contributed to the whole was determined. A minimum sample size of 123 was determined using Cochran's formula based on a population of 1,300. The sample size was increased to 151 to ensure adequate representation from the smallest center when the sample was proportioned among the centers. The clients were grouped by service center and random numbers assigned to the list for each center. Assigning random numbers to each client at each center facilitated follow-up and replacement should that become necessary. Given indications of difficulty in securing a suitable response from members of any 'reluctant population', such contingency planning was deemed appropriate. Similarly, a telephone follow up on non-respondents was planned to determine if the non-respondents were significantly different from those responding.

The instrument used was researcher developed and was based on available literature and the results of two previous studies (England 1982 & 1983). The instrument was divided into two elements, demographic information and perception of needs. Content validity of the instrument was established by a panel of experts drawn from university faculty and state displaced homemaker center staff. The instrument, with a cover letter, was mailed by first class. After the initial mailing, the state agency from whom the mailing list was obtained, developed reservations about a telephone follow-up and declined to provide phone numbers and expressed a desire that the numbers not be sought through other means. A decision was made to mail follow-up instruments to the sample until the yield from the follow-up dropped significantly over previous mailings. The inability to survey non-respondents made in inappropriate to generalize the findings beyond those responding.

Findings

Table 1 shows the rate of response for the first through fourth mailings at which point the return yield dropped significantly.

Table 1

Rate of Respondent Return of Questionnaire

No. of mailing	No. mailed	No. returned undel.	No. ret. answered	Total % usable
1	151	7	22	15.3
2	122	0	24	31.9
3	98	6	29	52.1
4	63	0	11	62.3

Note. N = 86

Almost eight percent those returned were returned as undeliverable while approximately one-third were unanswered after four mailings/reminders. Greater than 62 percent of the instruments were returned and provided usable data for the study. This yield was considerably greater than 15 to 20 percent often reported in studies of reluctant populations.

Table 2 reflects the rate of return by center location.

Table 2

Returns by Location

Location	Surveys mailed	No. of responses	Percent of response by center	Percent of responses
Lake Charles	27	17	62.9	19.8
Slidell	33	17	51.1	19.8
New Orleans	27	15	55.5	17.4
Lafayette	25	12	48.0	14.0
Baton Rouge	18	11	61.1	12.8
Shreveport	16	10	62.5	11.6
Monroe	4	4	100.0	4.7

Note. N = 86

Demographic Profile

The typical responding displaced homemaker was as divorced female between the ages of 31 and 40 with two children. She characterized herself as living in a small inner-city environment and reported holding a held a high school diploma. The majority of her support was reported as coming from personal salaries in the range of $501-$1,000 per month. The primary paid work experience reported was in areas of clerical/office and sales. Non-paid skills reported included housekeeping, child care, cooking, household bookkeeping, and management.

Center client contact

When asked how they became familiar with the displaced homemaker center, approximately 58 percent indicated a friend. the next most frequently reported sources were newspaper and city/state agency at approximately 18 percent each. The high percentage attributed to personal contact is consistent with that reported for many reluctant populations. Approximately 89 percent of the respondents indicated that the services offered by the displaced homemaker centers were not available elsewhere. If the respondent did not report that they were using the services of the center, they were asked to indicate the reason. Fifty percent of those responding that they did not use the center services reported a lack of transportation as the reason. The respondents were also given the opportunity to comment about the survey and/or the survey. The majority of the respondents responded favorably toward the center. Those who commented about the survey indicated that they were pleased that someone had taken an interest.

Client and administrator perceptions of need

Two identical lists of needs were mailed to respondents and the seven center administrators. The items included in this section of the instrument were identified from the literature, previous studies, and input from experts. The respondents were also afforded the opportunity to add additional items if they desired. For each item the respondent was asked to indicate perceived importance on a five point scale from "no importance" to "extremely important". Table 3 indicates the percentage of the respondents who perceived a need as either "very important" or "extremely important".

Table 3

Percent of Respondents Rating Items as "Extremely Important" and "Very Important"

Items	Client rating
1. Building self-confidence	76.4%
2. Advancement in employment	73.8%
3. Job acquisition skills	73.1%
4. Coping with stress	73.0%
5. Financial planning	70.6%
6. On-the-job training	67.6%
7. Personal counseling	63.4%
8. Finding places to go for help	62.9%
9. Problem-Solving/Decision Making	62.9%
10. Financial aid for getting an education	61.1%
11. Identifying interests & abilities	61.1%
12. Returning to school	60.6%
13. Housing	59.1%
14. Legal matters	58.0%
15. Resume writing	57.6%
16. Being a single parent	57.6%
17. Child care	53.7%
18. Family & home management	53.0%
19. Social skills	51.5%
20. Transportation	50.0%

The Kruskal-Wallis (K-W) test was used to determine if any of the differences between the were statistically significant. A significance index was developed that reported a significance value of .05 or less as "significant", those greater than .05 but less than .1 as an indication of a possible "trend" and deserving of further consideration, and values of greater than .1 were "not significant".

There were only four needs where the perceptions were, statistically significant between the clients and center directors. They were: (1) personal counseling; (2) building self confidence; (3) Job acquisition skills; and (4) finding places to go for help. Only one need, problem solving/decision making, could be considered a "trend". In all cases the center administrators indicated a higher degree of perceived importance than did the clients. Table 4 provides individual K-W values and significance index figures for each of the 20 items.

The clients did not report additional needs beyond the 20 listed. The administrators did report a few additional needs however, none occurred more frequently than once. These reported were: building and maintaining a support system, assertiveness training, support groups, health care and aging, and peer group counseling.

Further consideration of client responses

Further treatment of the client responses using factor analysis revealed that the items on the instrument would group into three factors; job, finance, and self. While no model was found explaining a significant portion of the variance for the self factor, a model was found for the factors job and finance. Thirty four percent of the variance of the variance for the factor job could be explained by the variables employment status, marital status and whether or not the individual was under 30 years of age. Thirty seven percent of the variance for the finance factor could be explained by the variables employment status, educational level, child care need, and marital status. While not central to this presentation, it does offer further insight that might prove of value to center administrators as they consider the broader focus of center programming.

Conclusions, implications and recommendations

The programs established at the seven displaced homemaker centers in Louisiana are providing services and assistance that are of vital importance to a segment of the population of this state. The administrators of the Displaced Homemakers Centers all have education and work experience relative to their position. They are generally aware of the problems and concerns that exist with the population they serve, and seem eager to address any areas of discrepancy that exist. The services which could be provided by the centers seem primarily limited by staff size and funding levels. Providing for counseling, specific job placement, and advancement opportunities, are areas in need of possible attention. Though many displaced homemakers had their needs met through the centers, expanded and in depth opportunities are needed.

Recommendations

1. Each center should review the data and consider modifying client services based on the results of this study. Specifically, attention should be given to the areas of personal counseling, building self-confidence, job-acquisition skills, and places to go for help. In these cases, the administrators consistently viewed these areas as more important than the clients. In the area of problem solving/decision making, there is strong evidence of the same perception.

2. A follow-up on each client using services of the Displaced Homemakers Centers should be conducted to determine the program effectiveness, to maintain client contact, and to allow for

continued participation in center activities by former clients. Such follow-up should facilitate programmatic adjustments thereby keeping program offerings abreast of client needs.

3. Center administrators should carefully note how clients become familiar with Center services and the reasons given for not utilizing services at the Centers.

REFERENCES

Arnold, C., & Marzone, J. (1981). *Needs of displaced homemakers*. San Francisco: Far West Lab. for Educational Research and Development.

Dahlberg, M. (1983). *A manual for post-secondary displaced homemakers programs*. Austin: Texas Education Agency.

Eastes, M. (1980). *An orientation workshop for displaced homemakers: A how-to handbook for service-providers*. Indianapolis: Indiana State Board of Vocational and Technical Education.

Education Development Center, Inc. (1980). *Resource guide for vocational educators and planners. Helping displaced homemakers move from housework to paid work through vocational training*. (Stock No. 065-000-0010-5). Washington, DC: U. S. Government Printing Office.

Elhardt, D., & Elhardt, L. (1970). *Displaced homemakers in North Dakota*. Bismarck: North Dakota State Board for Vocational Education.

England, C. (1982). *The problems faced by the matured woman entering the job market in the 80's after an extended absence.* Unpublished manuscript.

England, C. (1983). *An investigation of training programs for displaced homemakers in the area of occupational preparation at the post-secondary level*. Unpublished manuscript.

Fleming, J., & Malone, L. (1980). Help for the displaced homemaker. *Florida Vocational Journal*. *5*(16), 1-19.

Forsythe, S. (1978). The neglected woman. *Community and Junior College Journal*. *49*, 22-25.

Hixson, A. (1980). *Survey of rural displaced homemakers in Kentucky* Lexington, KY: Kentucky Division of the American Association of University Women.

Kirchmeier, M. (1979). Options. Albuquerque, NM: Albuquerque Technical-Vocational Institute.

Lee, J., & Smiley, D. (1981). Meeting displaced homemakers' needs with career education. Journal of Career Education. 8, 73-82.

Luttrell, W. (1982). Building multi-cultural awareness--A teaching approach for learner centered education. Philadelphia: Lutheran Social Mission Society.

Musickant, C. (1982). Displaced homemakers in Connecticut. Surveys and evaluation of services. Hartford: Connecticut State Department of Education; Division of Vocational Education.

Peltier, W. (1981). Displaced homemakers: Vo-tech workshop guide. Newton, MA: The WEEA Publishing Center, Educational Development Center.

Towns, K., & others. (1980). Guidelines for establishing programs and services for displaced homemakers. Middletown: Pennsylvania State University, Capitol Campus.

Vinick, B., & Jacobs, R. (1980). The displaced homemaker: A state-of-the art review. Newton, MA: Education Development Center, Inc.

Woods, D. (1978). Arizona: In search of the displaced homemaker. Tucson, AZ: Arizona Center for Educational Research & Development, College of Education.

Zendell, M. (1981). The displaced homemaker pilot project evaluation study. Report Number 81-15. Olympia: Washington State Council for Postsecondary Education.

The Determination of Statistical Sophistication of Research in Vocational Education

Chi Zhang
Assistant Professor
Department of Educational Development
University of Delaware
Newark, DE 19716

Paper Presented at the 1993 Annual Meeting of
the American Education Research Association
April 12, 1993
Atlanta

Abstract

This study examined the status of and changes in the statistical sophistication of research in vocational education in the 1980s. Based on analyses of 118 quantitative research articles published in four vocational education research journals, the study found that the statistical sophistication level of the majority of research in the 1980s was less than advanced. The statistical sophistication of research was related to both the problem area studied and the methodological strategy used. No changes were found in the use of statistical techniques and in the statistical sophistication of research from the early to the late 1980s.

THE DETERMINATION OF STATISTICAL SOPHISTICATION OF RESEARCH IN VOCATIONAL EDUCATION

The empirical-analytic paradigm of research in vocational education heavily relies on the use of statistics (Smith, 1984). The impact of statistical methods on vocational education research was recognized by many researchers in the field (Cheek, 1988; Warmbrod, 1986; Oliver, 1981).

The use of statistics in educational research can be traced back as early as 1901 when Edward L. Thorndike published his Noted on Child Study (Walker, 1956). However, it was around 1949 that "the era of empirical generalization" finally arrived in educational research (West & Robinson, 1980). In spite of frequent calls from many researchers in vocational education to broaden paradigms for inquiry in the last decade, quantitative research still prevailed in the field during the 1980s (Lynch, 1983; Hillison, 1989).

Research in vocational education and education in general has accumulated a considerable amount of knowledge regarding many aspects of the field. Vocational educators should depend on this valuable information to solve problems or to further our understanding about this profession. Because a great number of research literature used quantitative approach, an issue of technical readability of these reports needs to be addressed. A major factor that affects the readability is the use of statistical techniques in these reports. It is conceivable that the statistical sophistication of a report using simple descriptive statistics is lower than another one applying multivariate techniques, because the full understanding of the later techniques requires readers receiving further training in statistics.

Previous studies concurred that ANOVA, correlations, t-tests, regression, and chi-square tests were among the most frequently used techniques in educational research. Most studies found that significant changes did not occur within a period of ten years (Willson, 1980; West, Carmody, & Stallings, 1983; Rudolph, McDermott, & Gold, 1985; Elmore & Woehlke, 1988; Eason & Daniel, 1989; Emmons, Stallings, & Layne, 1990). Further examinations indicated that only a small proportion of statistical techniques used was at the "advanced" level (Goodwin & Goodwin, 1985a, 1985b; Teleni & Baldauf, 1989). Unfortunately, only one study was reported on the use of statistical techniques in vocational education (Kelly, Sproles, Camp, Hauser, & Kopf, 1989). Neither the use of specific techniques nor the statistical sophistication level was investigated in that study.

The classification system for statistical sophistication developed by Goodwin and Goodwin (1985a, 1985b) was widely used in later studies. This system categorized descriptive statistics, Pearson correlation, chi-square, t-tests, and one-way ANOVA into the "basic" level, other common univariate analyses (excluding nonparametric techniques) into the "intermediate" level, and multivariate techniques into the "advanced" level. However, previous studies in statistical sophistication were only limited to classify statistical techniques into the three sophistication levels. No studies attempted to study the overall statistical sophistication level of a research report.

Educational research is an ongoing process which starts at the determination of a problem followed by execution of research procedures (Gay, 1979). The subsequent stages of the process, including statistical analysis, are logically influenced by the nature of the research problem and the methodological strategy of a study.

Vocational education research covered a wide range of problem areas (COVERD, 1976; Schwandt, 1983; Seidman, 1985; Kapes & Bartley, 1986; Schultz, 1988; Kelly, Sproles, Camp, Hauser, & Kopf, 1989). On the other hand, several methodological strategies were used in educational research, such as surveys, field studies, and field experiments. It is not clear whether the use of statistical techniques differs among the studies focusing various problem areas or among those applying various methodological strategies.

This study attempted to answer the following three questions: (a) how to describe the level of statistical sophistication of research in vocational education in the 1980s? (b) whether the statistical sophistication of research was related to the problem areas studied and/or to the methodological strategies used? and (c) did the statistical sophistication of research change significantly in the 1980s?

Answers to these questions could not only enhance our understanding of the research process in vocational education but identify some directional changes in the research practice during the 1980s as well. The findings of this study may serve as a basis for setting appropriate statistical competency levels needed by researchers and other professionals in the field.

This study did not assume that the use of advanced statistics should always be desirable. The appropriate choice of statistical techniques in a study should be determined by its objectives, research design, and the nature of the data collected. However, this study made no judgement on the appropriateness of the use of statistical techniques.

Goals and Objectives

The purpose of this study was to describe the status of and changes in the statistical sophistication of research in vocational education in the 1980s. The study also sought to determine relationships among the statistical sophistication level, the problem area studied, and the methodological strategy used in vocational education research. Specific objectives of the study were to:

1. describe the statistical techniques used and determine the statistical sophistication of research;
2. describe the problem areas studied;
3. determine the relationship between the statistical sophistication of research and the problem area studied;
4. describe the methodological strategies used;

5. determine the relationship between the statistical sophistication of research and methodological strategy used;

6. determine changes over time in the statistical techniques used, the statistical sophistication levels, the problem area studied, and the methodological strategy used in the 1980s.

Methods

Population and Sample

The target population of this study was defined as the quantitative research articles published in the Journal of Vocational Education Research (JVER, N=109), the Journal of Agricultural Education (JAE, formerly the Journal of American Association of Teacher Educators in Agriculture, N=197), the Journal of Industrial Teacher Education (JITE, N=103), and the Journal of Vocational Home Economics Education (JVHEE, N=58) in the 1980s. These four primary research journals are all established with track records so that a sufficient number of articles could be sampled.

Stratified random samples were drawn from each journal in proportion to its total number of articles published. However, the articles only published in two time periods (a) 1980-83 and (b) 1986-89 were selected. Since JVHEE did not start to publish until 1983, the JVHEE articles only published in 1983 were selected for the period 1980-83. A total sample of 118 quantitative research articles was selected according to Cochran's sample size determination formula with a margin of error of 8% and a .05 α level (Cochran, 1977). The number of articles drawn from JVER, JAE, JITE, and JVHEE was 28, 50, 26, and 14, respectively. Half of the articles from each journal were selected from each of the two time periods.

Instrument Development

The instrument used in this study was developed by the researchers. The instrument reported by Schwandt (1983) was used to classify both the problem areas of study and the methodological strategies used. Each sample article was classified into one of the four problem areas: (a) teacher, (b) student, (c) curriculum, and (d) setting (Steiner's, 1978; Schwandt, 1983). Moreover, the primary methodological strategy of each sample article was classified into one of the following: (a) laboratory experiment, (b) field experiment, (c) field study and ex post facto research, and (d) population and sample surveys (McGrath, 1981; Schwandt, 1983). Only one problem area and one methodological strategy could be classified for each sample article.

A list of statistical techniques was identified according to Goodwin and Goodwin's studies (1985a, 1985b). In order to match each statistical technique in the list with its sophistication level, a panel of 18 experts was used for the validation. The panel members consisted of 15 vocational education researchers from 12 institutions and 3 statisticians from a major institution. The specific criteria used for the selection of panel members from vocational education were: (a) the candidate's direct involvement in publishing data based research articles, (b) the candidate's experience as a research journal editor, and (c) recommendations from the vocational education faculty at a major institution. Seventeen of the 18 panel members responded.

Each panel member received a mailed questionnaire containing the list of statistical techniques. Each statistical technique listed could be ranked as one of the three levels of sophistication: (a) basic, (b) intermediate, and (c) advanced. In addition, each panel member could either label the listed techniques as "unfamiliar" or list additional statistical techniques along with their corresponding sophistication levels.

In order to establish consistency in rating among the panel members, the three levels of sophistication were operationally defined by the researchers in the instruction of the questionnaire: (a) statistical techniques at the "basic" level should be understood by average readers who have completed one typical graduate level course in statistics; (b) those at the "intermediate" level should be understood by average readers who have completed two typical graduate level courses in statistics; and (3) those at the "advanced" level should be understood by average readers who have passed two typical graduate courses in statistics and at least one advanced course in statistics.

Based on the rating of the panel members, the median sophistication level of each technique was used as its sophistication level. Operationally, the highest level among all techniques reported in an article was defined as its level of statistical sophistication of research.

In order to measure the reliability of the instrument, a pilot study was conducted on 24 randomly selected articles from the four journals. The data coded included the problem area of the study, the methodology strategy used, each statistical technique reported and its corresponding level of sophistication, and the statistical sophistication of research of each article. A .90 test-retest reliability coefficient of the instrument was calculated by using the following formula:

$$\frac{(\#\text{ of Coding Agreements} - \#\text{ of Coding Disagreements})}{(\#\text{ of Total Coding})}$$

Data Collection and Analysis

Articles in the sample were analyzed and coded upon their availability to the researchers. Data collection was completed over a period of one month. During the data collection stage, the researchers read each sample article in its entirety. When more than one problem area was studied in one article, the problem area of that study was determined by the primary dependent variable investigated. On the other hand, if more than one strategy was used by a study, the dominant strategy used to gain knowledge about the major problem area was determined as the methodological strategy used by that study. Furthermore, if the same statistical technique was cited or used more than once in a single article, it was coded only once. Descriptive statistics, Spearman rank-order correlation, t-tests, and chi-square tests were used in data analysis. An α level of .05 was used in inferential statistics.

Findings

A total of 30 different statistical techniques was identified in the sample, ranging from simple descriptive statistics to multivariate techniques (Table 1). About 57% (n=67) of the sample articles were classified as "basic" in the level of statistical sophistication of research, 25% (n=30) as "intermediate", and 18% (n=21) as "advanced". About 94% of the sample articles (n=111) reported at least one type of descriptive statistic, whereas 88% of them (n=104) used at least one correlational-inferential statistical technique.

Insert Table 1 about here

The number of correlational-inferential statistical techniques reported per article ranged from 0 to 5, with the mean and median of 1.66 (SD=1.22) and 2, respectively. The most frequently used correlational-inferential techniques were identified as t-tests (n=33), Pearson correlation (n=32), one-way ANOVA (n=30), chi-square (n=18), multiple linear regression (n=12), factor analysis (n=12), and post-hoc multiple comparisons (n=11).

The reported techniques were further grouped into eight clusters (Table 2). The techniques listed under the cluster "ANOVAs" included one-way ANOVA, factorial ANOVA, and one-way ANCOVA. Pearson r, Spearman rho, Kendall's tau, Kendall coefficient of concordance, part/partial correlation, and other correlations were grouped together under "correlations". "Multivariate" techniques included factor analysis, MANOVA/MANCOVAs, discriminant analysis, path analysis, canonical correlation, cluster analysis, and LISREL. The techniques listed under the cluster "nonparametric" included Kolmogorov-Smirnov tests, Kruskal-Wallis one-way ANOVA, Wilcoxon rank sum test, Fisher's exact test, log-linear analysis, and omega-squared. Simple linear regression, and multiple linear regression were grouped under the cluster "regressions". However, planned orthogonal comparisons and post-hoc multiple comparisons were not included in any of the above categories because their use required the presence of ANOVAs. The most frequently used techniques by clusters were found in "descriptive", "correlations", and "ANOVAs", whereas the least frequently used techniques by clusters were found in "regressions" and "nonparametric".

Insert Table 2 about here

About 38% (*n*=45) of the sample articles were focused primarily on the problem area of "curriculum"; 25% (*n*=30) were on "teacher"; 23% were on "setting"; and only 14% (*n*=16) were on "student". A significant relationship was found between the problem area studied and the statistical sophistication of research (χ^2 (6, *n*=118) = 20.59, *p* = .02). Research on "student" tended to have a higher proportion classified as advanced statistical sophistication; research on "curriculum" tended to have a higher proportion classified as intermediate statistical sophistication; and research on "setting" tended to have a higher proportion classified as basic statistical sophistication (see Table 3).

Insert Table 3 about here

The study also found that 57% (n=67) of the sample articles used "survey" as the primary methodological strategy; 29% (n=34) used "field study and ex post facto research"; 13% (n=15) used "field experiment"; and very few (1%, n=2) used the "laboratory experiment" strategy. A significant relationship was also found between the methodological strategy used and the statistical sophistication of research (χ^2 (4, n=118) = 14.11, p = .007). Since only two cases were reported using "laboratory experiment" strategies, a category "experiment", which combined both "laboratory experiment" and "field experiment", was used in performing the chi-square test. Those research articles using "survey" or "experiment" as the primary strategy tended to have higher proportions classified as basic sophistication, whereas those using "field study and ex post facto research" tended to have equal distribution at the three sophistication levels (see Table 4).

Insert Table 4 about here

Statistical techniques in the eight clusters were further broken down by the two time periods in order to make comparisons (see Table 2). Only slight differences were found in the frequencies and ranks of the clusters between the two periods. A Spearman rank-order correlation coefficient (ρ) of .96 suggested that there was a very high degree of consistency in the type of statistical techniques reported between the two time periods.

In addition, average use of 1.76 ($\underline{SD}$=1.29) and 1.56 ($\underline{SD}$=1.15) correlational-inferential techniques per article were found in the 1980-83 and 1986-89 periods, respectively. An independent t-test was used to determine whether there was a significant difference on the average numbers between the two periods. The result ($\underline{t}(116) = .90$, $\underline{p} = .37$) suggested that, on average, a similar number of correlational-inferential techniques was used per article in the early and late 1980s. Moreover, no significant change occurred in the level of statistical sophistication of research in vocational education between the early 1980s and the late 1980s (χ^2 (2, $\underline{n}$=118) = .063, $\underline{p}$ = .97) (see Table 5).

Insert Table 5 about here

Chi-square tests of homogeneity were used to determine whether the problem area studied and the methodological strategy used differed between the early and late 1980s. No significant differences were found in either the problem areas studied (χ^2 (3,

n=118) = 2.02, p = .57) or the methodological strategies used (χ^2 (2, n=118) = .662, p = .72) in vocational education research between the two time periods (Table 6 & 7).

Insert Tables 6 & 7 about here

Conclusions and Discussions

Based on the findings of this study, the following three conclusions can be made:

1. the statistical sophistication level of research of the majority of studies in vocational education in the 1980s should be described as "basic", while only a few of them should be described as "advanced";

2. the statistical sophistication of research was related to both the problem area studied and the methodological strategy used among studies in vocational education;

3. the statistical sophistication of research did not change from the early 1980s (1980-83) to the late 1980s (1986-89) among studies in vocational education.

The very basic statistical techniques, such as t-tests, Pearson correlation, and one-way ANOVA, were among the most frequently used ones in vocational education research, which concurred with the previous findings in other fields of behavioral research (Edginton, 1964, 1974; Cartney, 1970; Willson, 1980; West, Carmody, & Stallings, 1983; Rudolph, McDermott, & Gold, 1985; Goodwin & Goodwin, 1985a, 1985b; Elmore & Woehlke, 1988; Eason & Daniel, 1989; Jarrell, Johnson, Chisom, & Hughes, 1989; Teleni & Baldauf, 1989; Emmons, Stallings, & Layne, 1990). The similarity in the use of statistics between research in vocational education and in other fields of behavioral science was also evident in that most sophisticated techniques were infrequently applied (Goodwin & Goodwin, 1985a, 1985b; Teleni & Baldauf, 1989). Goodwin and Goodwin's studies (1985a, 1985b) on the AERJ articles (American Educational Research Journal) from 1979 to 1983 indicated that 33%, 37% and 17% of the statistical techniques reported were at basic, intermediate, and advanced levels, respectively, whereas these figures were 35.3%, 43.1%, and 11.7% on the JEP articles (Journal of Educational Psychology) during the same period. Teleni and Baldauf's (1989) study showed that 63%, 28%, and 9% of the statistical techniques used in published linguistics studies during 1980-86 were basic, intermediate, and advanced, respectively.

From a practical standpoint of view, graduate programs of vocational education should ensure the inclusion of those statistical techniques at the basic and intermediate levels so that the graduates can understand the statistical aspect of most research literature in the field. On the other hand, future researchers in the field may consider additional preparation in statistics in order to comprehend some of the advanced techniques which were used in one-sixth of the current research literature in vocational education. Joint efforts between vocational education and other fields of education should be considered in offering statistics courses at all levels due to the similarity in the use of statistical techniques across the fields.

A major conceptual difference should be noted between this study and previous ones on the level of statistical sophistication. The focus of this study was on the statistical sophistication of research which was determined by the highest level of sophistication among all the statistical techniques used in a study. In contrast, all the previous literature focused on examining the sophistication levels of statistical techniques themselves. Due to this conceptual difference, any comparisons of findings on this aspect should be conducted cautiously.

Research in vocational education is a logical process with interrelated procedures. Statistical techniques are used in accordance with the purposes and strategies of the study. The nature of the relationships between the statistical sophistication of research and the problem area studied as found in this study was difficult to explain. One speculation is that research data on "student" are more accessible. As a result, more variables could be investigated in a single study. On the other hand, research on "setting" might rely on sources other than the school system to collect useful data. The limited access to useful information means fewer variables can be investigated in a study. Such speculation is based on the assumption that statistical techniques involving more variables tend to be more sophisticated.

This study confirmed the findings of many previous studies that "survey" has been the dominant strategy in educational research (Schwandt, 1983; Mannebach & Mckenna, 1984; Jarrell, Johnson, Chisom, & Hughes, 1989; Kelly, Sproles, Camp, Hauser, & Kopf, 1989). Strong emphasis on a single methodological strategy--"survey"--can be viewed against McGrath's (1981) notion of the "three-horned dilemma". The survey strategy may maximize generalizability, yet it also tends to minimize precision in measurement and realism of context. Several researchers have raised concerns on the heavy dependence on survey strategy in vocational education research (Schwandt, 1983; Mannebach & McKenna, 1984; Burnett, 1986; Hillison, 1990). One way out of this dilemma is to use a variety of methodological strategies in addition to survey across a given problem area in vocational education.

Since survey strategy was frequently used in vocational education research, its appropriateness of use needs to be further studied. How often was that survey strategy used repeatedly in inquiry within a given problem area? Does the nature of vocational education research call for using the survey strategy? And, do researchers in vocational education need surveys more or less than researchers in other fields? Answers for these questions can provide useful evidence to assess the criticism that vocational education research relied too heavily on survey.

The specific nature of the relationship between the statistical sophistication of research and the methodological strategy used may be explained by the different means used to control the threats to internal validity. The less frequent use of advanced statistical techniques in experimental research might be due to the rigorous control of extraneous variables by the design itself. On the other hand, survey research is usually descriptive in nature and does not attempt to establish causal relationships among variables. Again, in this situation, statistical controls are typically not needed. However, in field studies and ex post facto research, attempts might often be made to establish causal relations among variables. Threats to internal validity cannot normally be controlled by the research design in these situations. Therefore, statistical controls may be used to control threats to internal validity. However, further studies are needed to examine the differences in ways to control threats to internal validity among studies relying on various methodological strategies.

This study found that the use of statistical techniques and the statistical sophistication of research in vocational education did not change significantly in the ten-year time period from the early 1980s to the late 1980s. This conclusion agrees with the findings of some previous studies (Eason & Daniel, 1989; Goodwin & Goodwin, 1985a, 1985b; Willson, 1980) but disagrees with some others (West, Carmody, & Stallings, 1983; Emmons, Stallings, & Layne, 1990).

It is possible that a ten-year time period was too short to allow significant changes to occur in practice of vocational education research. Another plausible explanation for the lack of increase in statistical sophistication might be the heightened awareness and use of paradigms which call into question the traditional measurement and quantification assumptions. The third speculation is that the statistics training received by vocational education researchers has not changed significantly in the last ten to twenty years. The change in the researcher's statistical competency is a prerequisite for any changes to occur in performing statistical analysis. Further studies are needed to access the status of and changes in the statistical competency level of vocational education researchers in the last three decades.

One limitation of this study was the restricted sample size from only four major research journals in vocational education. Therefore, generalization of the research findings to other populations is not warranted. Moreover, all the available classification systems to categorize the problem areas or the methodological strategies have their pros and cons including Schwandt's (1983) used in this study. Personal bias or other systematic errors could still remain even though a high test-retest reliability coefficient was found in the instrument of this study.

One major development in educational research during the 1980s was the rapid popularization of computer applications. With the assistance of powerful software packages, the performance of sophisticated statistical techniques, especially multivariate techniques, became much easier. One potential side-effect of that is the abusive use of "fancy" statistical techniques. Knapp (1983) characterized such type of misuse as "underdesign and overanalysis". The stability in the use of statistical techniques in vocational education research may signify a likelihood that less of such abuse has occurred in this field. Stability is the most appropriate descriptor of vocational education research in the 1980s.

References

Burnett, M. F. (1986). The theoretical/conceptual framework of research as related to research design. Paper presented at the American Vocational Education Research Association Annual Meeting, Dallas, TX.

Cartney, J. L. (1970). On being scientific: Changing styles of presentation of sociological research. The American Sociologist, 5(1), 30-35.

Cheek, J. G. (1988). Maintaining momentum in vocational education research. Journal of Vocational Education Research, 13(1), 1-17.

Cochran. W. G. (1977). Sampling techniques. New York: John Wiley & Sons.

Committee on Vocational Education Research and Development (1976). Assessing vocational education research and development. Washington, DC: National Academy of Sciences.

Eason, S. H., & Daniel, L. G. (1989). Trends and methodological practices in several cohort of dissertations. Paper presented in at the Annual Meeting of the Southeast Educational Research Association, Houston, TX.

Edginton, E. S. (1964). A tabulation of inferential statistics used in psychology journals. American Psychologist, 19, 202-203.

Edginton, E. S. (1974). A new tabulation of statistical procedures used in APA journals. American Psychologist, 29(1), 25-16.

Elmore, P. B. & Woehlke, P. L. (1988). Statistical methods employed in American Educational Research Journal, Educational Researcher, and Review of Educational Research from 1978 to 1987. Educational Researcher, 17(9), 19-20.

Emmons, N. J., Stallings, W. M., & Layne, B. H. (1990). Statistical methods used in "American Educational Research Journal", "Journal of Educational Psychology", and "Sociology of Education" from 1972 through 1987. Paper presented at the Annual Meeting of the American Educational Research Association, Boston, MA.

Gay, L. R. (1979). Educational research: Competencies for analysis and application. Columbus, OH: Charles E. Merrill Publishing Company.

Goodwin, L. D., & Goodwin, W. L. (1985a). Statistical techniques in AERJ articles, 1979-1983: The preparation of graduate students to read the educational research literature. Educational Researcher, 14(2), 5-11.

Goodwin, L. D., & Goodwin, W. L. (1985b). An analysis of statistical techniques used in the Journal of Educational Psychology, 1979-1983. Educational Psychologist, 20(1), 13-21.

Hillison, J. (1990). Using all the tools available to vocational education researchers. Journal of Vocational Education Research, 15(1), 1-8.

Jarrell, M. E., Johnson, V. A., Chisom, B., and Hughes, K. R. (1989, November). Research methods, statistical procedures, and psychometric integrity of instruments used in Doctor of Education dissertations at the University of Alabama 1984-1988. Paper presented at the Annual Meeting of the Mid-South Educational Research Association, Little Rock, Arkansas.

Kapes, J. T. & Bartley, D. L. (1986). The theoretical/conceptual framework in vocational education research: State of art. Paper presented at the Annual Meeting of the American Vocational Association Research Association, Dallas, TX.

Kelly, M. E., Sproles, E. K., Camp, W. G., Hauser, D. A., & Kopf, D. W. (1989). The Journal of Vocational and Technical Education: A review of articles submitted and in Print. Journal of Vocational and Technical Education, 5(2), 50-60.

Knapp, T. R. (1983). Communications: Underdesign and overanalysis. Educational Administration Quarterly, 19(2), 108-113.

Lynch, K. B. (1983). Qualitative and quantitative evaluation: Two terms in search of meaning. Educational Evaluation and Policy Analysis, 5(4), 461-464.

Mannebach, A. J., & Mckenna, P. G. (1984). An analysis of research methodology used in agricultural education, 1974-1982. In Proceedings of the research conference in agricultural education, Eastern Region. Sturbridge, MA.

McGrath, J. E. (1981). Dilemmatics: The study of research choices and dilemmas. American Behavioral Scientist, 25(2), 179-210.

Oliver, J. D. (1981). Improving agricultural education research. The Journal of the American Association of Teacher Educators in Agriculture, 22(1), 9-15.

Rudolph, A., McDermott, R. J., & Gold, R. S. (1985). Use of statistics in the Journal of School Health, 1979-1983: A content analysis. Journal of School Health, 55(6), 230-233.

Schwandt, T. A. (1983). A framework for disciplined inquiry in vocational education. Journal of Industrial Teacher Education, 20(3), 49-56.

Schultz, J. B. (1988). The Journal of Vocational Education Research: The present. Paper presented at the Conference of American Educational Research Association, New Orleans, LA.

Seidman, P. F. (1985). Where we have been in vocational education research: A "geologic survey". Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Smith, B. B. (1984). Empirical-analytic research paradigm research in vocational education. Journal of Vocational Education Research, 9(4), 20-33.

Steiner, E. (1978). Logical and conceptual analytic techniques for educational researchers. Washington, DC: University Press of America.

Teleni, V. & Baldauf, R. B., Jr. (1989). Statistical techniques used in three applied linguistics journals "Language Learning", "Applied Linguistics", and "TESOL Quarterly" 1980-1986: Implications for readers and researchers. Eric Document 312905.

Walker, H. M. (1956). Methods of research. Review of Educational Research, 26(3), 323-344.

Warmbrod, J. R. (1986). Priorities for continuing progress in research in agricultural education. Paper presented at the 35th Annual Southern Region Research Conference in Agricultural Education, Little Rock, AR.

West, C. K., Carmody, C., & Stallings, W. M. (1983). The quality of research articles in the Journal of Educational Research, 1970 and 1980. Journal of Educational Research, 77(2), 70-76.

West, C. K. $ Robinson, D. G. (1980). Prestigious psycho-educational research published from 1910 to 1974: Types of explanations, focus, authorship, and other concerns. Journal of Educational Research, 73(5), 271-275.

Willson, V. L. (1980). Research techniques in AERJ articles: 1969 to 1978. Educational Researcher, 9(6), 5-10.

Table 1

Frequencies and Ranks of the Statistical Techniques Used

Statistical Techniques	Frequency	Rank
Level 1: Basic		
Descriptive[a]	111	1
t-tests	33	2
Pearson Correlation	32	3
One-Way ANOVA	30	4
Chi-Square	18	5
Spearman rho Correlation	4	12.5
Kendall's Tau Correlation	2	17
Simple Linear Regression	1	25
Level 2: Intermediate		
Multiple Linear Regression	12	6.5
Post-hoc Multiple Comparisons	11	8
One-Way ANCOVA	7	9
Factorial ANOVA	6	10.5
Part/Partial Correlations	4	12.5
Kendall Concordance Coefficient	2	17
Kruskal-Wallis One-Way ANOVA	2	17
Omega-Square	2	17
Other Correlations[b]	1	25
Planned Orthogonal Comparisons	1	25
Fisher's Exact Test	1	25
Wilcoxon Rank Sum Test	1	25
Kolmogorov-Smirnov Tests	1	25
Level 3: Advanced		
Factor Analysis	12	6.5
One-Way MANOVA/MANCOVA	6	10.5
Path Analysis	3	14

(table continues)

Table 1 (continued)

Statistical Techniques	Frequency	Rank
Level 3 Advanced		
Factorial MANOVA/MANCOVA	2	17
Discriminant Analysis	1	25
Canonical Analysis	1	25
Cluster Analysis	1	25
Log-Linear Analysis	1	25
LISREL	1	25

[a] Descriptive statistics included measure of central tendency, measures of variability, frequency, and percentage;

[b] Other Correlations included phi, rank biserial, point biserial, tetrachoric, biserial.

Table 2

Frequencies and Ranks of Statistical Techniques Used by Clusters in the 1980s

Clusters	1980s		1980-83		1986-89	
	Freq	Rank	Freq	Rank	Freq	Rank
Descriptive	111	1	55	1	56	1
Correlations	45	2	23	2	22	2
ANOVAs	43	3	22	3	21	3
t-tests	33	4	16	4	17	4
Multivariate	27	5	15	5	12	5
Chi-square	18	6	11	6	7	7
Regression	13	7	5	7.5	8	6
Nonparametric	8	8	5	7.5	3	8

Table 3

Cross Classification of Statistical Sophistication Levels by Problem Areas Studied

Problem	Statistical Sophistication Level (n/%[a])			Total
	Basic	Intermediate	Advanced	
Teacher	18/60.0	4/13.3	8/26.7	30/100
Student	5/31.3	4/25.0	7/43.8	16/100
Curriculum	23/51.1	16/35.6	6/13.3	45/100
Setting	21/77.8	6/22.2	0/.00	27/100
Total	67	30	21	118/100

Note. χ^2 (6, n=118) = 20.59. p = 0.02

[a] Row percentage.

Table 4

Cross Classification of Statistical Sophistication Levels by Methodological Strategies Used

Strategies	Statistical Sophistication Level (n/%[a])			Total
	Basic	Intermediate	Advanced	
Experiment	9/52.9	6/35.3	2/11.76	17/100
Field Study[b]	12/35.3	10/29.4	12/35.3	34/100
Survey	46/68.7	14/20.9	7/10.5	67/100
Total	67	30	21	118

Note. χ^2 (4, n=118) = 14.11. p = .007

[a] Row percentage

[b] Field study and ex post facto research

Table 5

Cross Classification of Statistical Sophistication Levels by the Two Time Periods

Period	Statistical Sophistication level (n/%[a])			Total
	Basic	Intermediate	Advanced	
1980-83	33/55.9	15/25.4	11/18.6	59/100
1986-89	34/57.6	15/25.4	10/16.9	59/100
Total	67	30	21	118/100

Note. χ^2 (2, n=118) = .063. p = .97

[a]Row percentage.

Table 6

Cross Classification of Problem Areas Studied by the Two Time Periods

Period	Problem Areas (n/%[a])				Total
	Teacher	Student	Curriculum	Setting	
1980-83	14/11.9	10/8.5	20/17.0	15/12.7	59/100
1986-89	16/13.6	6/5.1	25/21.2	12/10.2	59/100
Total	30	16	45	27	118/100

Note. $\chi^2(3, n=118) = 2.02$. $p = .568$

[a] Row percentage.

Table 7

Cross Classification of Methodological Strategies Used by the Two Time Periods

Period	Methodological Strategies (n/%[a])			Total
	Experiment	Field Study	Survey	
1980-83	7/5.4	17/14.4	35/29.7	59/100
1986-89	10/8.5	17/14.4	32/27.1	59/100
Total	17	34	67	118/100

Note. χ^2 (2, n=118) = .66. p = .718

[a]Row percentage

Vocationalism and Social efficacy: The Chinese model

Chi Zhang
Assistant Professor
Department of Educational Development
University of Delaware
Newark DE 19716

Paper Presented at the 1993 Annual Meeting of
the American Educational Research Association
April 13, 1993
Atlanta

Abstract

This study examined the roles of vocational education in China. Some historical, social, and economic factors related to the progress of vocational education were discussed. Three strategies were proposed in the future development of vocational education in China. Vocational education must not only contribute to build a strong economy but to empower individuals being better decision-makers in a democratic society. Attempts were also made to compare the vocational education systems between China and the United States.

VOCATIONALISM AND SOCIAL EFFICACY: THE CHINESE MODEL

Vocational education in China currently serves more than 6 million students. Reform of the Chinese educational system has a high priority to vocationalize its secondary education. According to the decision on "The Reform of China's Educational Structure" in 1985, a goal was set to reach a 50-50 mix of general education and vocational education at the senior high school level by the year 1990. From all the indications, this goal was reached successfully ("New calls", 1993).

In the past, little was known about the Chinese vocational education system in the West. It wasn't until recent years that a few reports were published to unveil the policy and practice of the Chinese system (Bott, 1988; Copper, 1988; Hawkins, 1988; Lewin & Xu, 1989; Tsang, 1990; Yang, 1990). The Chinese model of vocational education received high remarks for its economic, cultural, as well as social values (Yang, 1990). However, some questions were also raised on its program quality and economic efficiency (Liu, 1991; Tsang, 1991; Wang, Yang, Zhang, & Yang, 1991).

The goal of education in China was officially defined as "serving for the socialist economic construction" (Li, 1990). Such definition reflected a close linkage between education and the nation's economy. Because vocational education has its virtue as a viable alternative to develop a productive work force, the Chinese policy-makers turned to rely heavily on vocational education to build a strong national economy. In addition, vocationalizing secondary education may have some other potential benefits. Tsang (1991) stated that

> although the structural reform of secondary education is justified largely in economic terms, the desire of Chinese policy-makers to use vocational-technical education for social stratification and social control is an equally (if not more) important driving force for reform. (P. 79)

This study attempted to examine the roles of vocational education in China. There were four objectives of the study: (1) to examine the historical development of vocational education in China; (2) to examine the foundations of the vocational education system; (3) to develop some strategies for improving program quality, and (3) to compare the vocational education systems between China and the United States. Hopefully, this study could revamp our thinking on the relationships between education and work and between the educational democracy and social efficiency.

A Theoretical Framework

There were two major schools of philosophy regarding vocational education in the United States along its course of development -- the social efficiency theories of David Snedden and Charles Prosser and the social democracy theory of John Dewey (Wirth, 1974; Camp, 1983; Miller, 1990). "The educational plan of Snedden and Prosser rested on society's sense of what we required to be successful in the work force, whether it be the home, farm, business, or industry" (Miller, 1990). The social efficiency theories were the primary driving force pushing the passage of the landmark Smith-Hughes Act of 1917. Some of its impacts on American vocational education could be found in the current practice, including the existence of the dual school systems and the student "tracks" (Camp, 1983).

John Dewey believed that "vocational education was a means to induce changes that would improve all of education", and "occupations were central to life, and thus should be central to educational activity" (Miller, 1990). The impact of Dewey's thoughts on American vocational education has increased in the last few decades since the passage of the 1963 Vocational Education Act. In spite of points of agreement concerning the importance of vocational education, there was considerable argument between the Dewey and Snedden-Prosser camps.

In China, the policy-makers finally realized the potential values of vocational education in the economic build-up. But they have not developed effective strategies to direct its future progress. Many practitioners in the field had to use their limited imaginations to guide practices because the goals of vocational education were not clear to them. It's the time to think clearly and to develop a philosophy of vocational education in China. New approaches must be developed to insure both the healthy vocational life of individuals and economic advancement of the society.

The Historical Development of Vocational Education in China

A review of the historic development of vocational education in China would be helpful to understand its current status. The earliest attempts to develop vocational education in modern China were dated 1917. The Chinese Association of Vocational Education (CAVE), a civilian organization consisted of prominent educators and business leaders, was established in Shanghai in that year (Chen, 1979; Liu, Dong, and Zhu, 1986).

The two primary purposes of CAVE were "to popularize and improve vocational education; and to reform general education so that it can better prepare people for life and facilitate the improvement of vocations" (Chen, p. 292). CAVE proposed new school curricula which would enable students to develop vocational appreciation at the elementary level and to enter parallel vocational programs at the secondary level. The organization published a journal Education and Vocation and established a school named "The Chinese Vocational School" (Liu, Dong, & Zhu, 1986).

In 1931, the nationalist government passed the Vocational Education Act which created a separate vocational education system consisted of schools at both the junior and senior high levels (Liu, Dong, & Zhu, 1986). Unfortunately, social instability at the time did not allow a major development of vocational education in China (Chen, 1979).

Since the founding of the People's Republic of China in 1949, the development of vocational education has experienced several stages. The first could be called the experimental stage (1949-1965). One characteristic during this period was the coexistence of the old types of schools before the communist revolution and the newly established ones. Many secondary professional schools and secondary technical schools were established to educate technicians and skilled workers. There was a heavy influence of the Soviet vocational education models. The Communist educational reform during that time was mainly an experiment. A pragmatic approach was dominant in educational practices.

The second stage was during the Cultural Revolution (1966-1976). The goal of education was defined to raise communist political consciousness but not to develop academic and professional skills. The radical "leftist" approach added courses of Marxist theories at all school levels and lowered the academic and professional standards. Field trips to the work place became a significant component of the secondary curricula, which aimed at raising political consciousness instead of learning useful skills. During this period, many secondary technical schools and vocational high schools were closed. A dogmatic Marxist idealism did not tolerate any creative approaches.

The third period was the recovery stage (1977-1984). Major efforts were made to normalize education by repairing the damage caused by the Cultural Revolution. There was a strong emphasis on academic education even in vocational education programs. Most of the secondary technical schools were reorganized and reopened. In the early 1980s, the scale of vocational education had exceeded that before the Cultural Revolution. Still, there were no major breakthroughs to prioritize vocational education in the educational system. A mixture of philosophies co-existed throughout this stage.

The fourth period has been the reconstruction stage (1985-current). Two landmark events occurred in the mid-1980s. One was the decision on "The Reform of China's Educational Structure" in 1985 issued by the Communist Party of China (CPC). Another was the passage of the "Law of Compulsory Education" in 1986 by the National People's Congress (Lewin & Xu, 1989).

The potential values of vocational education were fully recognized by the policy-makers. One dramatic development was the transformation of many regular senior high schools into vocational high schools. As a result, vocational education has become an equal partner in secondary education in terms of the number of students enrolled. The reconstructionalist views of reformers brought new hopes for the life and future of vocational education.

However, several studies criticized the poor quality of many vocational education programs (Liu, 1991; Tsang, 1991; Wang, Yang, Zhang, & Yang, 1991). Vocational education need to build a positive image in the society. A new way of thinking is needed to sharpen its future direction as the country is moving toward a market economy.

The Foundations of Vocational Education in China

Several studies have described the vocational education system in China (Yang, 1990; Tsang, 1991; Bott, 1988). A main purpose of vocational education in China was to meet the manpower shortages of skilled technicians and skilled workers (Lewin & Xu, 1989). Vocational education programs were offered in the secondary professional schools, the secondary technical schools, the vocational high schools, etc. (Yang, 1991).

There were great variations among the vocational education programs. Generally, enrollments to the vocational education programs were quite competitive except for some vocational high schools. The employment opportunity was almost guaranteed for graduates from the secondary professional schools and for most of those from the secondary technical schools. Only a few programs in the vocational high schools would guarantee employment opportunities.

The development of vocational education in the 1980s was in response to the new structure of the nation's economy. As the process of industrialization accelerated in the 1980s, the demands for technicians and skilled workers became much greater. On the other hand, only a very small percentage of high school graduates could enter colleges and universities. There was a strong feeling that the old system of secondary education could no longer meet the needs of the society.

The decision on developing vocational education was a consensus among the poly-makers. Yet, the rationale for the goal of reaching a 50-50 match of general education and vocation by 1990 was not supported by any studies. There were hardly any good solutions to the emerging problems in recent years. No legislation has been passed to ensure the long-term stability of vocational education. The growth of vocational schools outpaced the development of effective strategies. In establish a solid foundation of vocation education in China, the poly-makers must fully consider its unique cultural and social environment.

The influence of traditional education

Education in China has been seen as a way of achieving wisdom, maintaining the family structure, establishing the law, and providing for social and economic concerns. The Chinese society was heavily influenced by Confucianism and treasured the values of education. As an ancient philosophy, however, Confucianist education was generally confined to the study of liberal arts, especially the classics. Subjects of practical arts were hardly being studied in the traditional schools in China.

It was only in the last forty years that schooling became popularized in the society. In the past, being educated meant to be prepared to climb in the bureaucratic hierarchies. The educational elitism believed the separation of minds from hands. They favored the exclusion of vocational subjects in school curricula. As a result, most high school students graduated without being well prepared either for life or for earning a living.

Current views of education believed that it should be primarily concerned with social and vocational skills (Ozmon & Craver, 1990). A wide gap must be crossed to accept this new concept for most people. It is difficult to eradicate the deep-rooted thoughts of elitism even in a modern society.

The economic reform

The reform policy has resulted in great social and economic changes in China in the last decade. The policy of central planning by the government was gradually replaced by the mechanism of market economy. In recent years, private businesses and joint adventures with foreign investments have brought new blood to the economic vessels. The business leaders have demanded a highly skillful work force to compete in the international and domestic markets.

The lack of engineers, technicians, and skilled workers has paralyzed many industries in China. A study indicated that engineers and technicians in the state-run enterprises only consisted of about 5 percent among all its employees (Liu, Dong, & Zhu, 1986). Besides, the ratio of engineers to technicians ranged from 3:1 to 9:1 in state-operated factories. In rural industries, even fewer technicians and skilled workers were available, because no graduates from colleges or technical schools were assigned to work there in the past. Thus, the overall demands for technicians were enormous.

On the other hand, the "iron bowl" policy of lifelong employment was being broken in the state-run enterprises. A large population of surplus employees would face unavoidable career changes. This population must receive necessary assistance or training to reenter the job market. Vocational education was also needed for those in the work force to maintain or advance their careers. Furthermore, a great need was emerged for the education of entrepreneurs. Therefore, vocational education has a great role to play in the current society.

The educational reform

The secondary school curriculum in China was typically standard without any elective courses. A great emphasis was placed on learning of science and mathematics in regular high schools. A common criterion to measure the success of a high school was the percentage of graduates entering post-secondary education. The national averages of this figure were about 4 percent in 1980 and 25 percent in 1989. Most high school graduates must be ready to enter the work force even without sufficient career preparations.

By transforming many regular schools into vocational schools, fewer students would compete for college entrance, and more students could be better prepared for work. This would not only assist more students for immediate employment but reduce the pressure from the public demanding more opportunities for higher education. This seemed to a practical way to achieve greater social efficiency.

Some problems in vocational education

A study by Wang, Yang, Zhang, and Yang (1991) identified several major problems of the current vocational education system in China: (a) the schools were too many in number but too small in size; (b) the specializations were too unstable and narrow; and (c) the employment rate of graduates in relevant areas was too low. Tsang (1991) listed additional problems in the Chinese system, which mainly existed in vocational high schools: (a) lack of qualified teachers; (b) lack of adequate curriculum materials; (c) lack of necessary facilities such as shops and fields; and (d) lack of funding.

It was not surprising to find these problems considering the enormous growth of vocational programs in recent years mandated by the government. But this may damage the image of vocational education and hinder its further development. Therefore, new strategies were needed to improve the quality of vocational education.

Strategies for improving vocational education

Central to the new strategies was a need to adopt a new philosophy of vocational education. Vocational education should be defined as "education aimed at the preparation of people for a working life" (Lewis, 1990, p. 13). It is a vital linkage between education and work. The success of a program should be determined by the performance and satisfaction of its graduates on the jobs. Vocational education must adapt to and serve the market economy in

China.

The first strategy was to continue the strong leadership of the government. Priorities should be on curriculum development and vocational teacher education. New textbooks in both areas of technical skills and applied academics must be developed. The qualification for the vocational teacher may need to include a minimum of working experiences in industry and business.

Vocational education is usually more costly than general education (Finch & Crunkilton, 1989). A study by the World Bank (1989) suggested that vocational education was several times as costly as general education in China. Full funding from the central government is unrealistic.

The allocation of government funds can be an effective means of quality control. Accountability should be built in any vocational education program. Competitions must be encouraged among the providers of vocational education. The poorly managed programs should be eliminated. The best programs in the nation could be used as demonstrations for the professionals in vocational education.

Second, vocational education must be based on the needs of the community. Vocational education is charged with the responsibility of maintaining strong ties with a variety of agriculture, business, and industry-related areas. Employers in the community are able to identify their needs and to assist the school in meeting these needs. Identifying the emerging sources of employment will also aid in keeping vocational programs relevant (Finch & Crunkilton, 1989).

In China, vocational high schools were run by the education bureaus. There were no close ties between vocational schools and the local business and industry. The establishment of a business-school partnership may be achieved by setting local advisory committees to vocational education. Vocational schools must fully use the resources in the community, such as funding, facilities and equipment, human resources, and cooperative training stations.

Third, vocational education must allow maximum individual choices. Great social efficiency can be achieved only if individuals in the society have developed their potentials. The goals of vocational education are not confined to the skill development of the students for immediate employment. It must contribute to a democratic society by empowering people to become responsible decision-makers. Individuals should be capable of making career decisions in a market economy.

The scope of vocational education may include helping people to enter, maintain, and advance their careers. Graduates of vocational education programs should have reasonable chances to receive a college education so that the traditional "tracks" in schools cannot block the social mobility of an individual. To ensure that, vocational curriculum should have a sound academic component which must be integrated with vocational skills. Vocational education programs must also be fully articulated in the whole educational system.

In short, the development of vocational education requires careful long-term planning with a futuristic vision. Joint efforts of schools and others in the local community are needed to ensure the program quality. Vocational education leaders must build a positive image of vocational education in the society.

Comparisons between Vocational Education in China and in the US

The policy-makers in both China and the United States have realized that vocational education could be an effective means to develop a productive work force. Vocational education in the United State is supported by efforts at the federal, state, and local levels. Yet, the national strategy for developing vocational education is usually reflected in federal legislation.

There have been three major stages in the development of vocational education in the United States. The first stage was during the period of 1917-1962. The federal government played a limited role of in vocational education. The dominate approach was to prepare people for specific jobs. The second stage was during 1963-1983. The federal government fully committed itself to the development to vocational education. The dominant approach was to center people preparing for various jobs. The third stage started in 1985 when the Carl Perkins Vocational Education Act was passed. The federal government shifted its major concern to social problems. The dominate approach has been focusing on equal education opportunities for disadvantaged populations.

In contract, vocational education in China has been supported primarily by the central government. Its sole focus has been on training individuals to satisfy the need of the society. The development of vocational education in China was relatively slow before the mid-1980s.

Strong support from the government is the major factor determining the success of vocational education. In the United States, federal support to vocational education was through the form of legislation, which has ensured the steady growth of the profession in a desirable direction. Without legal protection, the progress of Vocational education in China has experienced many twists in its course.

The historical debate between the Snedden-Prosser and the Dewey camps in the United States posed many fundamental questions to the Chinese model. The Chinese policy-makers should avoid repeating the same mistakes that the United Stated has made in the past. Most importantly, the Chinese model of vocational education must be based on its unique culture.

Currently, both countries are undergoing educational reforms. In the United States, the emerging issues include tech-prep, integrate curriculum, and vocational special needs. In China, major issues are the reform of entrance requirements, placement of graduates, and vocational teacher education. Both sides are calling for more involvement of business and industry and building a better image of vocational education.

Exchange of ideas among vocational educators between the two countries could only help improving the practice of the profession. In the age of global economy, there is a great potential for cooperation among vocational educators around the world.

Conclusions

Vocational education in modern China has experienced four stages in development. There is a great need for vocational education in China. Reform of the educational system has a high priority for the development of vocational education. Many regular high schools were transformed into vocational high schools.

Vocational education should be defined as education aimed at the preparation of people for a working life. A set of strategies is needed to guide its future development. Strong leadership from the government is essential. All vocational programs must be based on the needs of the community. Individuals should have maximum choices in the new vocational education system.

The effort to vocationalize secondary education in Chinese is probably one of the boldest field experiments ever conducted in the history of education. The success of this experiment is critical for the fate of vocational education around the world. Strong support from all sides is needed to help this experiment succeed. Vocational education researchers should keep continuous observation on its future development.

References

Bott, P. A. (1988). Vocational education in China. Vocational Education Journal, 63 (3), 26-28.

Camp, W. G. (1983). Social efficiency and vocational education: an examination of our changing philosophies. Journal of Vocational Education Research, 8 (3), 10-19.

Chen, J. (1979). The modern history of education in China. Beijing: People's Education Press.

Cooper, E. L. (1988, April). Agricultural and extension education in the Peoples's Republic of China. Per presented at the fourth annual conference of the Association for International Agricultural and Extension Education, Chevy Chase, MD.

Finch, C. R. & Crunkilton, J. R. (1989). Curriculum development invocational and technical education: Planning, content, and implementation (3rd. ed.). Needham Heights, MA: Allyn and Bacon, Inc..

Hawkins, J. N. (1988). The transformation of education for rural development in China. Comparative Education Review, 32 (3), 266-281.

Lewin, K, and Xu, H. (1989). Rethinking revolution; reflection on China's 1985 educational reforms. Comparative Education, 25 (1), 7-17.

Lewis, T. (1990). Toward a new paradigm for vocational education research. Journal of Vocational Education Research, 15 (2), 1-30.

Li, T. (1990, January 3). A report on the issues regarding education in our country. People's Daily (Oversee Ed), pp. 1, 4.

Liu, C., Dong, X., & Zhu, X. (1986). Administration of vocational and technical education. Beijing: Popular Science Press.

Liu, C. (1991). Quality is the life of vocational and technical education. Chinese Education: A Journal of Translation, 24 (3), 45-51.

Miller, M. D. (1990). Policy issues perspectives. In A. J. Pautler Jr. (Ed.), Vocational education in the 1990s: Major issues (pp. 25-44). Ann Arbor, MI: Prakken Publications, Inc..

New calls to fasten the reform of vocational and technical education by the National Commission on Education (1993, January 11). People's Daily (Oversee Edition), p. 3.

Ozmon, H. A. & Craver, S. M. (1990). Philosophical foundations of education (4th ed.). Columbus, OH: Merrill Publishing Company.

Tsang, M. (1991). The structural reform of secondary education in China, Journal of Educational Administration, 29 (4), 65-83.

Wang, R., Yang, P., Zhang, S., and Yang, D. (1991). Problems and policies regarding the return of investment in vocational education (Excerpt). Chinese Education: A Journal of Translation, 24 (3), 82-89.

Wirth, A, (1974). John Dewey's philosophical opposition to Smith-Hughes type vocational education, Educational Theory, 22 (1), 69-77.

World Bank (1987). Technical/vocational education for China's development. Washington DC.

Yang, D. L. (1990). The development of technical and vocational education and youth employment in China, Education with Production, 7 (1), 67-75.

Reconceptualizing Vocational Education
With Concept Mapping

Debra D. Bragg
Assistant Professor
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign
1310 South Sixth Street
Champaign, IL 61820

C. Michael Harmon
Research Specialist/Behavioral Sciences
Center for Prevention Research and Development
Institute of Government and Public Affairs
University of Illinois
1002 West Nevada
Urbana, IL 61801

Running Head: RECONCEPTUALIZING VOCATIONAL EDUCATION

Abstract

All aspects and level of education are being urged to reform. Postsecondary vocational education is no exception. Business and industry leaders, policy makers, federal and state agency officials, educational researchers, and many other stakeholder groups are advocating improved the quality of postsecondary education. Given these pressures to reform, what changes do practitioners intend to make in postsecondary vocational education programs? This research study utilized a relatively new data collection technique called concept mapping to conceptualize what vocational education ought to be at three different types of postsecondary educational institutions in the midwest. Stakeholder participants in the research study represented students, faculty, administrators, and business and community leaders. Findings from the study produced a vision of postsecondary vocational education at the three sites and contributed to development of a knowledge domain for postsecondary vocational education for the purposes of developing outcomes assessment approaches.

Reconceptualizing Vocational Education With Concept Mapping

Since the early 1980s, policy makers, business and industry leaders, and educational reformers have called for dramatic changes in quality and performance in all aspects of education (see, for example, Association of American Colleges, 1985; Secretary's Commission on Achieving Necessary Skills, 1991; U.S. Department of Education, 1991). Postsecondary education has not escaped the calls for reform. Accreditation associations have been a particularly influential force in the movement to implement reform in postsecondary education (Marchese, 1990; McGuiness, 1991). In addition to these associations, almost three-fourths of the states have recommended that public postsecondary institutions make improvements and incorporate rigorous outcomes assessment (Banta, 1990). States such as Florida, Georgia, New Jersey, and Tennessee have proceeded to develop student outcomes assessment systems (Astin, 1991).

In addition, current federal legislation has reinforced the importance of reform and accountability, particularly in the arena of postsecondary vocational education. The Carl D. Perkins Vocational and Applied Technology Education Act of 1990, commonly known as Perkins II, has prominently positioned new initiatives such as integration of academic and vocational education and Tech Prep on the list of educational reforms. Perkins II requires that states measure student gains in academic and occupational competence as a means of determining the

---

This paper was presented at the annual conference of the American Educational Research Association on Tuesday, April 13, 1993 in Atlanta, GA. Points of view presented here do not necessarily represent the position or policy of the sponsor of this research, the National Center for Research in Vocational Education (NCRVE) through a grant from the U.S. Department of Education. The authors would also like to express gratitude to Dr. Thomas E. Grayson who facilitated the concept mapping sessions and prepared the initial draft of these research findings. For additional information on this research see Grayson, T. E. (1992, December). Concept Mapping. In D. Bragg (Ed.), *Alternative Approaches to Outcomes Assessment for Postsecondary Vocational Education*. Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

effectiveness of these and other reform initiatives. Looking generally at vocational education programs, Hoachlander and Rahn (1992) report that measures of academic and occupational competence are under development in the majority of the fifty states.

Reform initiatives originating from these many sources, particularly from contemporary policy and research, are stimulating practitioners to change postsecondary vocational education. Given the pressures to reform, what changes do practitioners intend to make in postsecondary vocational education programs? How do practitioners conceptualize a reformed approach to vocational education? What is a practitioner's vision of what postsecondary vocational education ought to be? These questions provided the focus for this research study and the basis for the findings presented in this paper.

Objectives

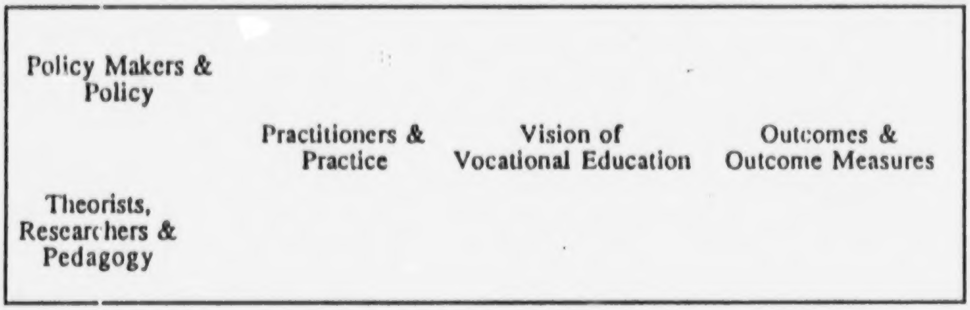
The purpose of this paper is to report findings from a research study designed to conceptualize the contemporary meanings of vocational education and to identify outcome measures that could be used to assess those meanings. The study was conducted during the summer and fall of 1992 with three midwest postsecondary educational institutions: a public comprehensive community college, a proprietary technical institute, and a two-year public technical college. The methodology for this study was descriptive and included the use of small group idea-generation processes, surveys, card sorts, and multivariate statistical analysis techniques. Primary objectives of the study that were addressed in this paper were to:

1. describe a vision of vocational education revealed through concept maps generated by stakeholder representatives of three midwest postsecondary educational institutions.

2. compare the characteristics of concept maps generated by the three types of postsecondary institutions: comprehensive community college, proprietary technical institute, and public technical college.
3. discuss the implications of concept mapping methodologies for reconceptualizing postsecondary vocational education and developing outcomes assessment approaches for newly envisioned educational programs.

Conceptual Framework

Recommendations made by various stakeholder groups point to the need to reconceptualize vocational education and redefine educational accountability systems to reflect competencies needed to function in the family, the workplace, and society at large. From the perspective of federal policy (i.e., Perkins II) and the other stakeholder groups identified earlier in this paper, the time is right for pursuing a new vision of vocational education, along with a more expansive set of outcome measures for these programs. Whereas these changes are often called for by groups outside of the realm of practice of vocational education, it is the collective judgment of local practitioners that makes reform happen. Given that perspective, our research focused on how practitioners were interpreting calls for reform and moving toward a new vision of vocational education? A visual representation of the conceptual framework for this research study is displayed below.


Policy Makers & Policy
Theorists, Researchers & Pedagogy
Practitioners & Practice
Vision of Vocational Education
Outcomes & Outcome Measures

Methods

This descriptive research study used a relatively new technique called concept mapping as the primary data collection methodology. Concept mapping provides a means of articulating and structuring participant stakeholders' ideas in a visual form, called, not surprisingly, concept maps. The purpose of this concept mapping research project was to describe basic tenets and key components of postsecondary vocational education from the perspective of four stakeholder groups: faculty, administrators, students, and local business, labor, and community constituents (Grayson, 1992). The basic tenets of vocational education were identified and their interrelationships and relative importance were visually displayed in the form of concept maps. The maps were then systematically used by the participant stakeholders to develop a shared vision for postsecondary vocational education and create a framework for identifying measures for outcomes assessment.

Structured concept mapping is based on a three-phase model for conceptualizing program theory developed by Trochim and Linton (1986). This model suggests there are three general phases in conceptualizing program theory:

1. Generating a conceptual domain out of thoughts, ideas, intuitions, theories, and problem statements.
2. Structuring a conceptual domain by defining or estimating relationships between an among concepts.
3. Representing the structured set of concepts in a conceptual domain verbally, pictorially, or mathematically.

Based on this model, a conceptual domain for postsecondary vocational education was created and represented in the form of concept maps. Maps created at the three institutions participating in the study were compared and contrasted to identify common themes for the postsecondary vocational education domain.

Site and Participant Selection

Three sites were selected for this study through a nomination process involving national leaders in the field of postsecondary education, supplemented with recommendations from midwest state and local agency personnel. The three postsecondary institutions selected for this study were viewed by individual nominees as being effective delivers of vocational education and innovators in institutional effectiveness, program evaluation, and/or student outcomes assessment. Each of these institutions was actively involved in or completing an institution-wide outcomes assessment initiative precipitated by an accreditation association. In addition, each institution was engaged in institutional renewal and/or curriculum reform as evidenced by their participation in Tech Prep, Total Quality Management (TQM), or outcomes-based education. The three institutions were selected from the midwest primarily to contain costs.

In each of the three postsecondary institutions, the data collection involved between twenty-one and thirty-seven stakeholder participants who were purposively selected. Four stakeholder groups were represented in each of the sessions: administrators, faculty, students, and community/business/labor representatives. Individual representatives of these groups were viewed as key to reconceptualization of vocational education within the three postsecondary institutions. Based on criteria provided by the researchers, each site was instructed to select at least five representatives of each stakeholder group. The participants selected by sites were to be articulate; well-versed on local educational policy issues and community needs; cooperative; and enthusiastic about contributing to a new vision of vocational education for their perspective institutions.

Data Collection and Analysis Procedures

The concept mapping data collection process for this study began with a face-to-face meeting involving the researchers and a planning team at each institution. Based on a collaborative planning effort at each of these meetings, a detailed plan was developed for conducting concept mapping at each site to meet the goals of this project and, if possible, meet needs of each institution.

Given only minor adjustments, the data collection occurred very similarly at each of the sites. In all three cases, the first session was a five-hour group brainstorming and individual survey and card sorting activity. The second session, conducted approximately one week after the first session, was a three-hour group interpretation session. Participants also provided demographic information at the first session and completed end-of-session feedback forms after the second session. This information was valuable in creating a richer understanding of the backgrounds of participants and explaining why they may have expressed certain preferences for postsecondary vocational education. The feedback forms provided information about the level of the satisfaction of participants with the concept mapping group experience as well as in determining participant perceptions about the validity of the maps. In addition to these data, contextual information was collected regarding each postsecondary educational institution to provide better understanding of organizational structures and policies.

The first session in the concept mapping exercise began with a thirty-minute introduction to the concept mapping process. Then participants, grouped with other members of their stakeholder group (e.g., faculty, student), were given the following focus statement: *Generate a list of statements (word or short phrases) describing what vocational education ought to be*. In each site, this exercise took from two to three hours to create the final list of brainstormed ideas. Then this list of ideas was used to create a 5-point Likert scale rating form that was completed by all participants. In addition, participants were engaged in an individual card-sorting exercise to group and name the brainstormed statements.

With these data collected, a software program called the Concept System (Trochim, 1989) was used to compute maps based on the rating and card sort data. The package utilizes multivariate statistical techniques including multidimensional scaling and cluster analysis. For each site, several maps were created along with supporting information to help explain the vision of postsecondary vocational education developed by each group. In all cases participants were involved in the final development and interpretation of the concept maps.

Findings and Discussion

This section of the paper reports findings for each of the midwest postsecondary educational institutions. For each site, information is reported regarding the general mission of the institution, enrollment, budget, and faculty composition. The characteristics of individuals who participated in this study are also reported. Next, key findings from the concept maps generated in each setting are provided. Finally, a comparison of concept map findings across the three sites is made and their meaning is discussed.

Site One: The Public Comprehensive Community College

This comprehensive community college is located on two campuses approximately thirty-five miles apart. One campus is located in a metropolitan area of nearly one-quarter million population and the other in a predominantly rural area. The combined student enrollment at the two campuses is about 7,200 students. Sixty-two percent of the student body is female; the same percentage is part-time. About half the students are enrolled in prebaccalaureate/transfer programs. Approximately ninety percent are white, non-Hispanic; about five percent are

African-American; and five percent are Hispanic. The college employs a total of twenty-three full-time administrators and 220 full-time faculty. In fiscal year 1991, annual tuition and fee charges were $1,245 placing this college at the high end of tuition costs within its state.

Altogether there were thirty-eight participant stakeholders involved in this concept mapping activity. Of these, twenty-four were male and ten were female. Thirty-five were white/Caucasian, two were Native American, and one was Hispanic. Thirteen participants were faculty; one was on the faculty of a nearby public four-year state university, and one was on a faculty member at a local high school. These fifteen participants taught in a wide range of academic and vocational education areas. Many of these individuals also had dual or multiple responsibilities other than teaching such as coordinating various types of partnerships with college, local businesses, and community agencies; designing curriculum and courses relating to vocational education; and advising students.

Ten college administrators participated in the exercise. They were employed as deans, vice presidents, managers, coordinators, or directors of various academic, technological, or vocational departments/divisions. One of the administrators was employed by the nearby four-year state university. Eight participants represented local businesses, labor organizations, or community groups. There were five student participants. These individuals were enrolled in mechanical technology design, small business administration, computer graphics and drafting, or liberal studies.

During the first session the thirty-seven participants generated over two-hundred and fifty ideas about what vocational education ought to be. These statements were refined and culled to rid them of redundancy to create a list of ninety-eight statements (see Table 1), the maximum number of statements allowed by the statistical software package used to analyze these data. A broad range of statements is evident in this list of statements and is reflective of the diversity of the participants.

Insert Table 1 about here

Using the Concept System software, these brainstormed statements were plotted in the form of a point map (see Figure 1). The number of each statement was plotted on the map according to its proximal similarity to other statements. Statements that were sorted together during the card sort exercise appeared closer to each other than statements that were not sorted together. In Figure 1, statements such was "exemplify instructor cooperation and teamwork," "have specific teacher training requirements," "encourage vocational educators to stay current in the field, adapt to change," and "employ quality/enthusiastic instructors who have practical experience" were sorted similarly and are located close together on the far left side of the map. On the other hand, the two statements of "teach students to recognize their skill limits and strengths" and "have active advisory committees involving industry and educators" were viewed as being very different as is evident by their location on opposite sides of the map (i.e., the first statement is at the middle top and the second statement is at the middle bottom.)

Insert Figure 1 about here

Once this point map was created, various configurations of clusters were superimposed on the points based on statistical and conceptual criteria. During the second interpretative session, participants were given several cluster map configurations and were asked to select the one map that best represented their vision of what vocational education ought to be. The participants chose the ten cluster solution shown in Figure 2.

Insert Table 2 and Figure 2 about here

Findings presented in Table 2 further explicate the meaning of this ten cluster map based on the listing of ideas linked to each cluster. Participant stakeholders examined the statements in each cluster and named the ten clusters. Aided by the statistical analysis, participants then identified regions of the map and labeled them. In this particular map, five regions were identified: foundations, curriculum, administration and partnerships, faculty, and student services (Table 3).

Evident from the ten cluster map presented in Figure 2 is the importance of the curriculum and foundations regions. Within the curriculum region, participants rated the cluster labeled integrated and outcomes based as highest in priority, giving it an average rating of 3.99 on a 5-point priority rating scale. Highly rated ideas contained in this cluster were "be hands on/experiential," "integrate theory and practice," and "prepare individuals with specific job/vocational skills" (Table 2).

Close behind in importance was the cluster labeled comprehensive curriculum with an average rating of 3.69. This cluster contained ideas such as "have curriculum based on work experience" and "be relevant to current and future

Table 3
Listing of Regions and Clusters for the Comprehensive Community College

Region	Clusters
I: Curriculum	1. Integrated and outcome based 2. Comprehensive curriculum 3. Career preparation and objectives
II: Foundations	4. Foundational skills 5. Personal development
III: Support Services	6. Student support systems 7. Diversity and accessibility
IV: Faculty	8. Faculty/teaching
V: Administration and Partnerships	9. External coordination and partnerships 10. Administrative support

job training." The cluster labeled foundational skills in the foundation region was given a similar level of priority (3.78). Important ideas presented in this region were "teaching computer/technology literacy," "provide technical reading/writing skills and teach how to follow oral and written directions," "include basic skills" and "include basic problem solving" (Table 2).

Two additional regions contained clusters of importance to participants. The cluster labeled faculty/teaching in the faculty region was given a priority rating of 3.62 by participants. Two highly rated ideas in this cluster were "encourage vocational educators to stay current in the field..." and "employ quality/enthusiastic instructors who have practical experience." Finally, the cluster labeled external coordination and partnerships in the administration and partnerships region was given a similar level of priority (3.65) by participants. Three important ideas in this cluster were "supported by the community," "be adequately funded to ensure quality education," and "include cooperation and coordination of secondary education, postsecondary education, business, industry, labor, and the community" (Table 2).

It is important to note that five of the ten clusters were given relatively lower priority ratings by participants. These were the clusters labeled administrative support, personal development, career preparation and objectives, and the two clusters in the support services region labeled student support systems and diversity and accessibility. This finding reveals that whereas these ideas were a part of the vision for what vocational education ought to be, they were not viewed as high a priority by the entire group as the other five clusters.

Site Two: The Proprietary Institute

The proprietary institute is a private, non-profit, endowed collegiate institute of technology located in a major metropolitan area in the midwest. The institute is one of the oldest of its kind in the United States and both nationally and internationally recognized as a leader in technology education. Enrollment at the institute was 1,076 full-time and part-time students during the 1990-91 school year. Historically the institute has been dominated by white male students, however a current goal is to diversify the student body by gender, race, and ethnic origin. The institute operates with an very lean administrative and support staff which totals thirteen. Fifty-six faculty are employed by the institute. Full-time student tuition for the 1992-1993 school year was not to exceed $1,161 for a 12-week quarter or about $4,833 for the academic year.

A total of twenty-one individuals participated in this concept mapping activity. All but one of the participants was male. Only one of the participants was a member of a minority group, i.e., African-American. Six of the participants were administrators at the institute; they described their job responsibilities as involving administration of general education, technical education, instruction, admissions, marketing, and continuing education. The five faculty who participated in the research had from four to seventeen years of experience with the institute. They were responsible for teaching auto mechanics, speech communication, electronics technology, basic electronics and microcomputers, and sheet metal.

The seven student participants ranged in age from nineteen to thirty-nine. These students were majoring in the following subjects: architectural drafting and estimating, machine shop, architectural technology, engineering design, and computer services. The remaining three participants represented business, industry, labor, or the community. Two of these participants were engineers; one working for city government and the other employed by a heating, venting, and air conditioning company. The other business representative was a Vice President for Sales and Manager of Operations for an electronics business.

This group of twenty-one participant stakeholders generated approximately two hundred ideas during the brainstorming exercise. The refined list of statements totaled ninety-eight (see Table 4), which was the maximum number of statements allowed by the software program. Again, the list of statements reflected a broad array of ideas related to postsecondary vocational education. The point map showing the location of these statements is shown in Figure 3.

Insert Table 4 and Figure 3 about here

Similarly to the procedure used at the other two sites, participants were given several cluster maps to review and asked to reach consensus about the map that best represented their vision of what vocational education ought to be. These participants chose the twelve cluster solution shown in Figure 4. The listing of ninety-eight brainstormed statements by cluster and one average priority rating for each cluster is shown in Table 5.

Insert Table 5 and Figure 3 about here

The labels assigned to the twelve clusters are shown in Table 6 along with the three regions of the map to which those twelve clusters were designated. Based on the consensus decision reached by participants, the regions of this map of postsecondary vocational education were curriculum, image, and student needs/services.

Table 6
Listing of Regions and Clusters for the Proprietary Institute

Region	Clusters
I: Curriculum	1. Curriculum content 2. Fostering professionalism/leadership 3. Teaching industry standards 4. Institutional direction/accountability
II: Image	5. Faculty quality 6. Relationship with industry 7. Marketing/image
III: Student Needs/Services	8. Adaptive educational programming 9. Transitionary 10. Affordable/accessible 11. Guidance and career awareness 12. Student services

Referring to the twelve cluster map shown in Figure 4, it is apparent that the vast majority of the clusters were given a high priority rating by the participants. Within the curriculum region, all four clusters were viewed as high priority to participants. The cluster labeled curriculum content received an average rating of 4.06 on a 5.0 Likert scale. Highly rated items in this cluster were "be up to date (cutting edge) curriculum" and "be thinking-oriented (i.e., no one correct way to solve)." The cluster identified as fostering professionalism/leadership was the highest rated cluster of all twelve, receiving an average rating of 4.17. Highly rated ideas within this cluster were "emphasize hands-on learning," "create a desire to learn," "prepare students to be marketable," and "hold students accountable." A third highly rated cluster in the curriculum region was labeled teaching industry standards, receiving an average rating of 3.86. Typical of ideas contained in this cluster was "be based on industry standards" and "be accountable to industry and students." The fourth cluster in this region was labeled institutional direction/accountability and was given an average rating of 3.61. Top rated ideas in this cluster were "be on the leading edge of technology" and "have a clear mission/be visionary."

A second region in this concept map was labeled by the participants as image. The three clusters identified with this region were marketing/image, faculty quality, and relationship with industry. The cluster of faculty quality was given the highest average rating of the three. Faculty quality received an average rating of 3.83. Two highly rated ideas contained in this cluster were "be taught by qualified teachers "good instructors" and "be taught by qualified and experienced teachers." The cluster labeled marketing/image was the most highly rated cluster in this region, receiving an average rating of 3.66. Highly rated ideas in this cluster were "have a positive image," "have clearly defined admission standards," and "provide tools to elementary and secondary personnel to recognize vocational education as an equal alternative."

Similarly to the concept maps developed at the other sites, another region in this concept map was labeled student needs/services. Within this region there were four clusters: affordable/accessible, student services, guidance and career awareness, transitionary, and adaptive educational programming. All of these clusters except student services were viewed as being relatively high priority. Important ideas linked to the transitionary cluster were "be placement driven" and "provide state of the art, well maintained facilities and equipment." The cluster labeled affordable/accessible was tied to the idea of being "cost effective for students (salary/education costs)." The most highly rated idea linked to guidance and career awareness was "provide job placement." An important idea related to the cluster of adaptive educational programming was "be ongoing (life-long learning, renewable, updateable)." Whereas all of the ideas contained in the student services were given lower priority ratings, the idea of providing "for financial aid" received the highest priority rating.

Site Three: The Public Technical College

This public technical college has a long history of delivering vocational education, beginning in the early 1900s at the secondary level and expanding in the 1960s to the postsecondary level. The technical college is located in a community of approximately 60,000. The curriculum of the college involves a broad array of vocational education programs including computer and other sophisticated technologies. Students can obtain associate degrees or certificates at the college. The 1990 enrollment of full-time and part-time students totaled nearly 20,000 with 57 percent being female and 43 percent being male. The student body, in both credit and noncredit courses, consisted of 97 percent white students and 3 percent minorities representing Asians, African-Americans, American Indians, and Hispanics. In 1991 the college employed sixty-five professional/administrative staff and one hundred and seventy-eight instructors. The cost of tuition and fees was relatively low. Student fees in 1990-91 were $24.60 per quarter credit, set in accordance with state statutes based upon estimated operational expenditures and full-time equivalent (FTE) students for the entire state system.

A total of twenty-one individuals participated in this concept mapping exercise. Nine of the participants were male; twelve were female. Only one of the participants was a member of a minority group; he was Hispanic. Seven of the participants were members of the faculty. These individuals had between two and twenty-one years of experience teaching at the college. Subjects taught by these instructors were reading, business and office occupations, child care, marketing, commercial art, and nursing. One member of this group of faculty was the lead counselor for the college and responsible for career and personal counseling.

Five administrators participated in the concept mapping exercise. Three of these individuals had worked at the college for many years; two had twenty or more years of experience and another had twelve years experience. The remaining two administrators had one and seven years experience at the college. These individuals were responsible for executive-level administrative assistance, general education, community education, trade and industrial programs, and human services.

A total of five students participated in the concept mapping activity. The students ranged in age from nineteen to thirty-nine. They were majoring in the following areas: air conditioning, accounting, and nursing. Finally, four representatives from the business and community participated in the research. These individuals were an assistant bank vice president; a supervisor of a local job service; a business owner and school board member; and the Executive Director of the local Private Industry Council (PIC).

During the brainstorming session, approximately two hundred and twenty-five ideas were generated and then culled to create a list of eighty-six ideas (see Table 7). The point map displaying the location of each of the statements is shown in Figure 5. Similarly, to the other lists of brainstormed statements created for this research study, the ideas were extremely diverse.

Insert Table 7 and Figure 5 about here

During the second session, participants reviewed alternative cluster maps and reached consensus on the ten cluster map as the best representation of their view of what vocational education ought to be (see Figure 6). The list of brainstormed statements related to each of the ten cluster areas is presented in Table 8, along with the average priority rating for each idea and cluster.

Insert Table 8 and Figure 6 about here

Table 9 displays the labels given to the ten clusters and three regions of the map during the interpretation session. The regions of the map identified by participants of this technical college were curriculum/career opportunities, meeting needs of business and community and responsive instruction, and student services.

Table 9
Listing of Regions and Clusters for the Public Technical College

Region	Clusters
I: Curriculum/Career Opportunities	1. Career opportunities 2. Responsive program design 3. Quality connections/credentials 4. Employment-focused curriculum
II: Meeting Needs of Business & Community & Responsive Instruction	5. Business/community partnerships 6. Relevant/quality instruction 7. Stewardship & image 8. Faculty/professional development
III: Student Services	9. Support services 10. Accessibility

Referring to the ten cluster map shown in Figure 6, the clusters identified by the participants demonstrated a restricted range of importance from a low of 3.0 to a high of 3.92 on the 5-point Likert scale. The clusters given the highest priority in the entire map were two clusters in the curriculum/career opportunities region labeled career opportunities and employment-focused curriculum and the one cluster in the business and community/responsive instruction region labeled relevant/quality instruction.

Looking only at the curriculum/career opportunities region, four clusters make up the region. As was reported previously, the career opportunities cluster was a high priority as is evidenced by an average cluster rating of 3.88. This cluster was characterized by ideas such as "lead to employment," "enhance careers and enrich jobs," and "result in career advancement (promotion)." The cluster in this region labeled responsive program design received an average cluster rating of 3.43 and contained concepts such as "use state of the art technology" and "be designed to be appropriate length to meet the needs of its clients (industry and students)." A third cluster labeled quality connections/credentials received an average cluster rating of 3.31 and contained the concepts of "provide transferable credit to other institutions" and "be worth going to (meaningful)." The fourth cluster, the one rated of highest priority to participants, with an average rating of 3.92--was labeled employer-focused curriculum. High priority concepts in this cluster were "provide for specific occupational training" and "prepare students to be problem solvers/critical thinkers."

A second region of the map labeled meeting needs of business and community and responsive instruction contained four clusters as well. The cluster of highest priority to participants was labeled relevant/quality instruction; it received an average cluster rating of 3.79. High priority concepts in this cluster were "have current knowledge and skills" and "provide flexible instruction to meet retraining need." The cluster labeled business/community partnerships received an average priority rating of 3.69. High priority ideas in this cluster were "be reflective of community employment needs," "provide qualified workforce," and "develop responsible workers." Of slightly lower priority rating were the clusters labeled faculty/professional development and stewardship and image, receiving average cluster ratings of 3.50 and 3.38 respectively. An important concept in the faculty/professional development cluster was "provide adequate time and resources for faculty and staff development." Within the stewardship and image cluster, an important concept was "have sufficient resources (time, staff, materials) to meet established goals and priorities."

The third region was characterized by student concerns; the two clusters in that region were labeled support services and accessibility. The support services cluster received an average cluster rating of 3.00 and was characterized by concepts such a "provide financial support for day care," "provide support services (i.e., day care, counseling, etc.) at all times of day," and "provide lower book prices or a rental system for books." The remaining cluster, labeled accessibility, received a higher average cluster rating of 3.54 by participants. Concepts that portrayed this cluster were "be open to all (accessible)" and "have more contact with counselors/ advisors."

Comparison of Findings Across Sites

Further analysis of concept maps generated for each of the postsecondary institutions revealed several consistent themes for the domain of postsecondary vocational education. Across the three sites there were similarities in some of the regions of the maps identified for all three postsecondary institutions. Two regions that were consistently identified by the three sites were curriculum and student/support services. There were also similarities among regions involving relationships with industry and partnerships, however each institution chose slightly different labels for these regions. Somewhat unique among the concept maps was the identification of the foundations and faculty regions in the concept map of the comprehensive community college. Whereas these concepts were not particularly unique to any of the lists of brainstormed statements created by any of the three sites, they were unique in that they broke out into separate regions of this map.

There were also parallels in the clusters that were identified in the maps. Clusters that appeared to be particularly similar were those that specified ideas related to career preparation and opportunities; comprehensive curriculum; faculty; image; student support services/systems; accessibility; and relationships, partnerships, and coordination with external groups, especially business and the community. Within each map, however, there were unique clusters that tended to provide a distinguishing feature for each of the postsecondary institutions. For example, only the comprehensive community college created clusters in the areas of integrated and outcomes-based curriculum and foundational skills. Only the public technical college identified clusters labeled quality connections/credentials and employment-focused curriculum. Finally, only the proprietary institution created clusters labeled teaching industry standards and fostering professionalism/leadership. These unique clusters appeared to provide a sense of uniqueness to the vision of each of these types of institutions yet still remain relatively consistent about what the fundamental meaning of vocational education.

By examining the ideas created by each of the postsecondary institutions, it was also possible to identify parallels in a reformed approach to vocational education across the three institutions. Some of these concepts addressed the importance of hands-on experiential learning and experience, the need for education to lead to employment, and the importance of keeping faculty and curriculum up to date with industry and technological changes. Another important idea shared by the three types of institutions was the importance of curriculum that integrates vocational and academic education and provides a bridge between theory and practice, creating what one participant called a "balanced education." The teaching of decision making, planning, forecasting, critical thinking, and problem solving was important to participants in all three postsecondary settings. Participants in all three of the settings spoke about enabling students to learn how to learn. It is important to note, however, that while participants gave a high priority to these types of foundational competencies, participants in all three institutions envisioned the importance of occupational training and job/vocational skills through specific, focused, or customized curriculum. Therefore, while the vision of postsecondary vocational education included foundational, employability, and basic skills competencies, it also included the more job specific occupational component. The stakeholder participants seemed to be encouraging a mix of breadth and depth in a curriculum as a basis for postsecondary vocational education.

Finally, in all three settings participants identified the need for vocational education to be competency or outcomes based and capable of producing measurable outcomes. In order to do this, participants in all three settings emphasized the importance of having sufficient resources to meet established goals and to ensure quality education. Beyond this important idea, participants in one of the institutions envisioned vocational education that would also hold students accountable for contributing to the quality of the educational experience. Therefore, participants seemed to be emphasizing the importance of a shared vision for vocational education as well as a shared relationship among stakeholders to ensure that that vision is actually carried out.

Implications of Concept Mapping Methodologies

As reform occurs, a new vision of vocational education will be required. Changes in educational goals, populations served, and delivery systems across educational settings, including vocational and technical education areas necessitates changes in accountability and indicators of program and institutional quality. Without valid programmatic goals and parallel outcome measures, postsecondary education's capability of demonstrating effectiveness, assessing impact, and improving quality is hampered. Results of this research have revealed the potential for enlightening policy makers, practitioners, and researchers alike on the domain of postsecondary vocational education through the use of concept mapping. Utilization of the concept mapping technique appeared to be valuable in obtaining information for reconceptualizing vocational education and determining its related outcome measures. Even more important, the concept mapping methodology seemed to provide a helpful and relatively user-friendly vehicle for designing much needed outcomes assessment processes for postsecondary institutions that deliver vocational education.

References

Association of American Colleges. (1985). *Integrity in the college curriculum: A report to the academic community.* Washington, D.C.: Association of American Colleges.

Astin, A. W. (1991). *Assessment for excellence.* New York: Macmillan Publishing Company.

Banta, T. W. (1990, June). *Assessment update: Ends, means, and results.* In Proceedings of the consortium for Institutional Effectiveness and Student

Success: Transforming Community Colleges for the 1990's (pp. 2-15). Ann Arbor, MI: Community College Consortium.

Grayson, T. E. (1992, December). Concept mapping. In D. Bragg (Ed.), *Alternative approaches to outcomes assessment in postsecondary vocational education* (MDS-239). Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Hoachlander, E. G., & Rahn, M. (1992, March). *Performance measures and standards for vocational education: 1991 survey results* (MDS-388). Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Marchese, T. J. (1990, Fall). Introduction. *NCA Quarterly, 65*(2), 371-373.

McGuiness, A. C. (1991). *State postsecondary education structures handbook.* Denver, CO: Education Commission of the States.

Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for America 2000.* Washington, D. C.: U.S. Department of Labor.

Trochim, W. M. (1989). An introduction to concept mapping for planning and evaluation. *Evaluation and Program Planning*, 12, 1-16.

Trochim, W. M, & Linton, R. (1986). Conceptualization for planning and evaluation. *Evaluation and Program Planning, 9*(4), 289-308.

Table 1
Brainstormed Statements from the Comprehensive Community College (n=98)

1. Be hands on/experimental
2. Provide incentives to keep students in school
3. Teach computer/technology literacy
4. Encourage ethical practices/professional ethics/work ethic
5. Foster a real acceptance of vocational education by higher education
6. Supported by the community (financial, input, advisory committees, etc.)
7. Have relevant Illinois college entrance requirements
8. Provide global perspective/economy
9. Have a historical perspective
10. Develop accountability/responsibility for actions on the job
11. Articulated between all levels
12. Provide technical reading/writing skills and teach how to follow oral and written directions
13. Provide leadership development and be a change agent
14. Provide career awareness K-infinity
15. Encourage nontraditional careers
16. Encourage vocational educators to stay current in the field, adapt to change (staff development), and be involved in action research
17. Prepare individuals with specific job/vocational skills
18. Be enjoyable and personally meaningful, interesting, fun
19. Integrate theory and practice
20. Include reasonable expectations of employment (employability/job oriented)
21. Include cooperation and coordination of secondary education, postsecondary education, business, industry, labor, and the community
22. Be proportional in length to the skills being taught
23. Include basic problem solving
24. Stress team working/building skills
25. Teach job seeking skills
26. Teach students to recognize their skill limits and strengths
27. Stress safety
28. Provide familiarity with all tools and equipment to perform vocational skills, including slang terms (business jargon)
29. Consider environmental awareness
30. Be useful/practical/valuable for students
31. Be competency-based with demonstrated outcomes
32. Be accessible (e.g., distance, time, money, qualifications, age, etc.)
33. Be outcomes based
34. Be a source of pride
35. Increase student self-esteem
36. Develop critical thinking
37. Have curriculum based on work experience
38. Have on-going assessment and revision
39. Integrate vocational and academic content
40. Be adequately funded to ensure quality education
41. Be multidisciplinary
42. Encourage creativity
43. Involve faculty in curriculum development
44. Exemplify instructor cooperation and teamwork
45. Have clear entrance requirements
46. Have clear exit requirements
47. Use total quality management to guide practice
48. Respect/consider ethnic, cultural, and gender differences
49. Teach decision making skills, planning skills, forecasting skills, productive thinking skills
50. Have exemplary facilities for teaching and learning
51. Be accredited between appropriate agencies
52. Involve professional organizations
53. Work with both large and small businesses
54. Have specific teacher training requirements
55. Involve state and federal programming (resources, networking, etc.)
56. Apply research findings from vocational education

57. Reflect institutional goals
58. By physically located with other programs
59. Provide training for a wide range of jobs/careers
60. Teach learning how to learn
61. Match individual interests, aptitudes, and skills with vocations
62. Be relevant to current and future job markets (industry based)
63. Explore/provide career opportunities and hands-on internships
64. Teach organizational (workplace) and job keeping skills
65. Rename vocational education to applied education
66. Provide student and family support services (e.g., counseling, advising)
67. Be taught by an integrated team (system)
68. Be pre-professional/technical level (not postgraduate)
69. Include job shadowing, placement, and follow-up
70. Provide continual training for employees supported by employers
71. Include health and wellness
72. Include people of all ages curriculum design
73. Include basic skills (e.g., reading, writing, math, science)
74. Prepare students for job requirements/be relevant and responsive to meeting industry needs
75. Teach interpersonal and communication skills
76. Encourage continuing or lifelong learning
77. Have active advisory committees involving industry and educators
78. Have state of the art equipment
79. Overcome negative attitude of vocational training by community, business, and higher education
80. Offer internship programs/on the job training
81. Employ quality/enthusiastic instructors who have practical experience
82. Use a variety of teaching styles
83. Help older or new students to adjust to school or job environments
84. Provide for life experience proficiency/credit
85. Be clearly defined, career (path) oriented
86. Offer comprehensive curriculum
87. Cover a variety of service areas (different fields)
88. Offer classes at variable times (flexibility scheduling)
89. Keep up to date with industry/technological changes
90. Provide more training in primary and secondary programs
91. Interact directly with business/industry (e.g., planned business tours)
92. Match training with local job market
93. Provide more self-employment training
94. Require appropriate prerequisite courses
95. Ensure that students have access to funding/financial aid
96. Have less administrative interference and more decisions by professors and students
97. Offer students a course on services for people with disabilities
98. Be realistic

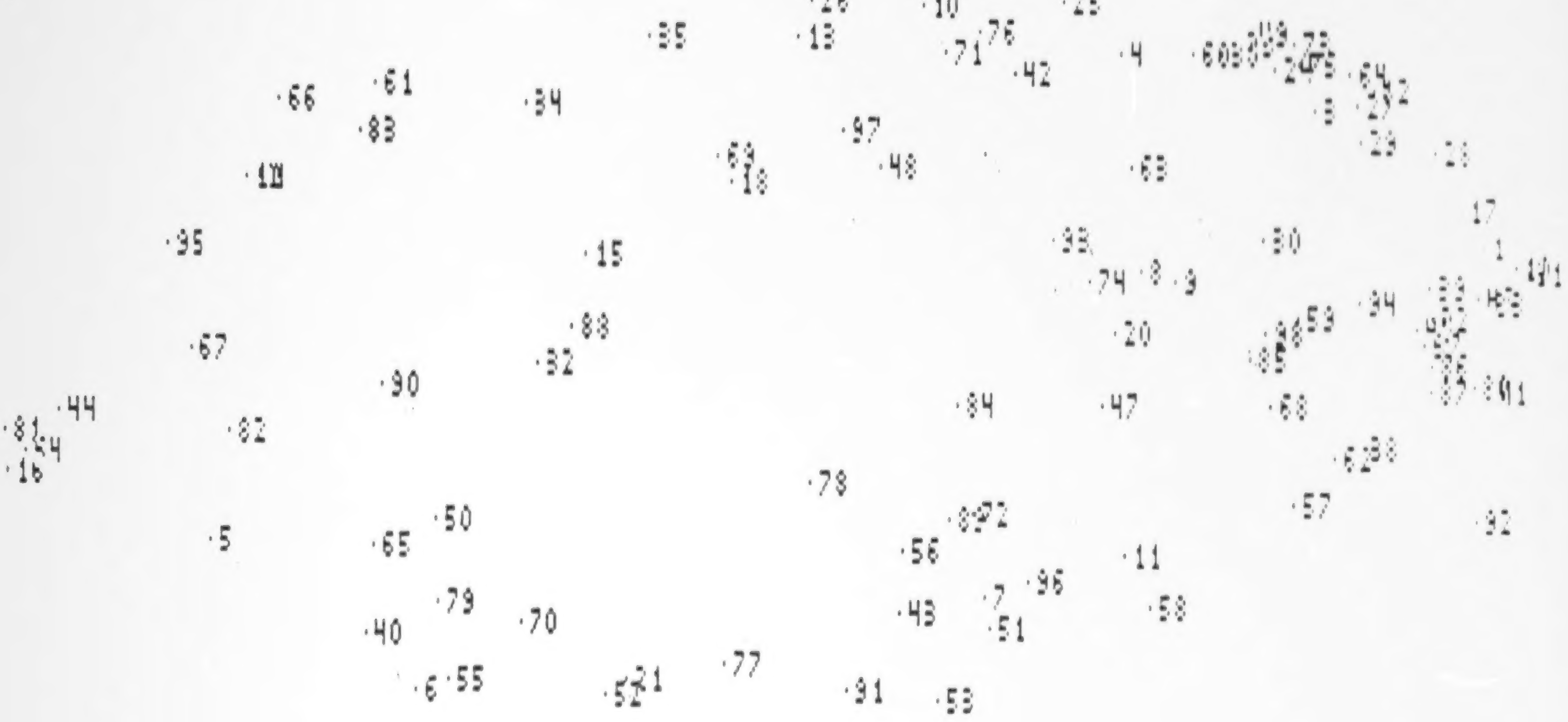
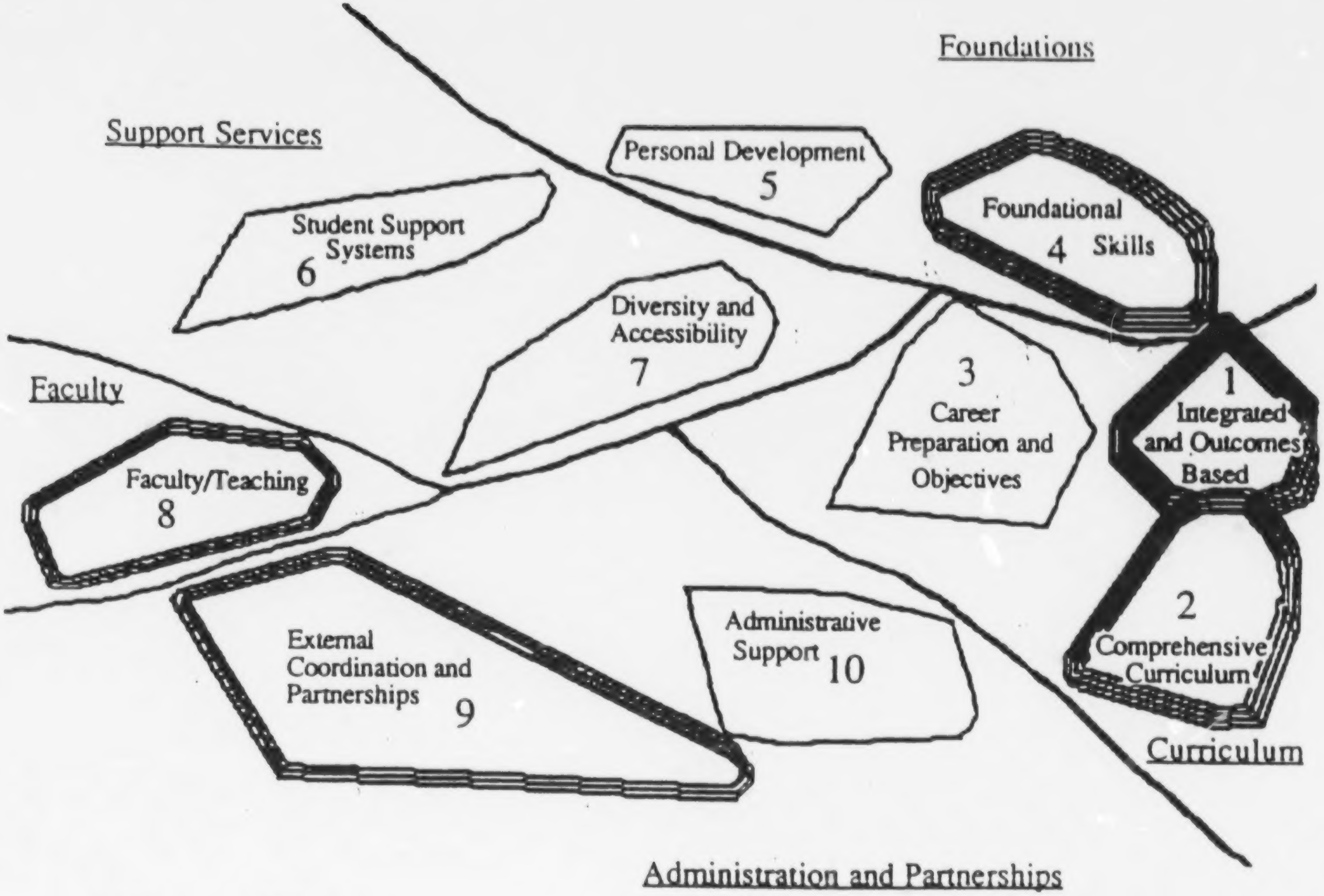


Figure 1. Number Point Map for Brainstormed Statements from the Comprehensive Community College


Foundations
Support Services
Personal Development
5
Student Support Systems
6
Foundational
4
Skills
Diversity and Accessibility
7
3
Career Preparation and Objectives
1
Integrated and Outcomes Based
Faculty
Faculty/Teaching
8
External Coordination and Partnerships
9
Administrative Support
10
2
Comprehensive Curriculum
Curriculum
Administration and Partnerships

Level	Value
1	2.08 to 2.58
2	2.58 to 3.08
3	3.08 to 3.58
4	3.58 to 4.07
5	4.07 to 4.57

Figure 2. Cluster Priority Rating Map of Vocational Education for the Comprehensive Community College

Table 2
Brainstormed Statements and Priority Ratings Grouped by Cluster for Comprehensive Community College

---

Cluster 1 - Integrated and Outcomes Based

1. Be hands on/experiential (4.57)
17. Prepare individuals with specific job/vocational skills (4.39)
19. Integrate theory and practice (4.44)
31. Be competency-based with demonstrated outcomes (4.31)
22. Be proportional in length to the skills being taught (3.44)
45. Have clear entrance requirements (3.44)
39. Integrate academic and vocational content (4.17)
94. Require appropriate prerequisite courses (3.33)
33. Be outcomes based (4.00)
46. Have clear exit requirements (3.81)

Cluster Average = 3.99

Cluster 2 - Comprehensive Curriculum

37. Have curriculum based on work experience (4.06)
86. Offer comprehensive curriculum (3.47)
41. Be multidisciplinary (3.36)
80. Offer internship programs/on the job training (4.11)
87. Cover a variety of service areas (different fields) (3.28)
38. Have on-going assessment and revision (3.94)
62. Be relevant to current and future job markets (industry based) (4.33)
57. Reflect institutional goals (2.94)
92. Match training with local job market (3.75)

Cluster Average = 3.69

Cluster 3 - Career Preparation and Objectives

8. Provide global perspective/economy (2.69)
9. Have a historical perspective (2.08)
74. Prepare students for job requirements/be relevant and responsive to meeting industry needs (4.42)
93. Provide more self-employment training (2.78)
30. Be useful/practical/valuable for students (4.00)
63. Explore/provide career opportunities and hands-on internships (4.08)
20. Include reasonable expectations of employment (employability/job oriented) (4.11)
59. Provide training for a wide range of jobs/careers (3.33)
98. Be realistic (3.39)
68. Be pre-professional/technical level (not postgraduate) (2.08)
85. Be clearly defined, career (path) oriented (3.64)
47. Use Total Quality Management to guide practice (3.08)
84. Provide for life experience proficiency/credit (3.17)

Cluster Average = 3.30

Note: Priority ratings are averaged for each statement and presented in parentheses. Each statement was rated on a 1 to 5 scale where: 1 = very low priority, 2 = low priority, 3 = moderate priority, 4 = high priority, and 5 = very high priority. Cluster averages reflect the mean for all statements grouped within each of the clusters.

Cluster 4 - *Foundational Skills*

3. Teach computer/technology literacy (4.17)
27. Stress safety (3.25)
12. Provide technical reading/writing skills and teach how to follow oral and written directions (4.28)
64. Teach organizational (workplace) and job keeping skills (3.50)
28. Provide familiarity with all tools and equipment to perform vocational skills, including slang terms (business jargon) (3.53)
29. Consider environmental awareness (2.89)
4. Encourage ethical practices/professional ethics/work ethic (3.69)
36. Develop critical thinking (3.92)
60. Teach learning how to learn (3.64)
23. Include basic problem solving (4.00)
49. Teach decision making skills, planning skills, forecasting skills, productive thinking skills (4.28)
73. Include basic skills (e.g., reading, writing, math, science) (4.08)
24. Stress team working/building skills (3.86)
75. Teach interpersonal and communication skills (3.83)

Cluster average = 3.78

Cluster 5 - Personal Development

10. Develop accountability/responsibility for actions on the job (3.78)
13. Provide leadership development and be a change agent (3.14)
26. Teach students to recognize their skill limits and strengths (3.25)
25. Teach job seeking skills (3.03)
42. Encourage creativity (3.39)
71. Include health and wellness (2.58)
76. Encourage continuing or lifelong learning (3.72)

Cluster average = 3.27

Cluster 6 - Student Support Systems

2. Provide incentives to keep students in school (2.49)
14. Provide career awareness K-infinity (3.19)
95. Ensure that students have access to funding/financial aid (3.58)
34. Be a source of pride (3.78)
35. Increase student self esteem (3.5)
61. Match individual interests, aptitudes, and skills with vocations (3.64)
66. Provide student and family support services (e.g., counseling, advising) (2.69)
83. Help older or new students to adjust to school or job environment (3.06)

Cluster average = 3.24

Cluster 7 - Diversity and Accessibility

15. Encourage non-traditional careers (2.97)
32. Be accessible (e.g., distance, time, money, qualifications, age, etc.) (3.94)
88. Offer classes at variable times (flexibility, scheduling) (3.53)
18. Be enjoyable and personally meaningful, interesting, fun (3.86)
69. Include job shadowing, placement, and follow-up (3.25)
48. Respect/consider ethnic, cultural, and gender differences (3.58)
97. Offer students a course on services for people with disabilities (2.40)

Cluster Average = 3.37

Cluster 8 - Faculty/Teaching

16. Encourage vocational educators to stay current in the field, adapt to change (staff development), and be involved in action research (4.47)
54. Have specific teacher training requirements (3.33)
81. Employ quality/enthusiastic instructors who have practical experience (4.42)
44. Exemplify instructor cooperation and teamwork (3.42)
67. Be taught by an integrated team (system) (2.94)
82. Use a variety of teaching styles (3.72)
90. Provide more training in primary and secondary programs (3.03)

Cluster Average = 3.62

Cluster 9 - External Coordination and Partnerships

5. Foster a real acceptance of vocational education by higher education (3.53)
50. Have exemplary facilities for teaching and learning (3.86)
65. Rename vocational education to applied education (2.17)
6. Supported by the community (financial, input, advisory committees, etc.) (4.17)
55. Involve state and federal programming (resources, networking, etc.) (3.08)
40. Be adequately funded to ensure quality education (4.42)
70. Provide continual training for employees supported by employers (3.75)
79. Overcome negative attitude of vocational training by community, business (3.44)
21. Include cooperation and coordination of secondary education, postsecondary education, business, industry, labor, and the community (4.17)
52. Involve professional organizations (3.69)
77. Have active advisory committees involving industry and educators (3.92)
53. Work with both large and small businesses (3.67)
91. Interact directly with business/industry (e.g., planned business tours) (3.64)

Cluster Average = 3.65

Cluster 10 - Administrative Support

7. Have relevant Illinois college entrance requirements (2.97)
96. Have less administrative interference and more decisions by professors and students (2.78)
43. Involve faculty in curriculum development (4.11)
51. Be accredited between appropriate agen (3.94)
11. Articulated between all levels (3.56)
58. By physically located with other programs (2.31)
56. Apply research findings from vocational education (3.22)
72. Include people of all ages in curriculum design (2.47)
89. Keep up to date with industry/technological changes (4.53)
78. Have state of the art equipment (3.83)

Cluster Average = 3.37

Table 4
Brainstormed Statements from the Proprietary Institute (n=98)

1. Be up to date (cutting edge) curriculum
2. Be a ticket to a pay check
3. Be pertinent to a specific curriculum (focused/customized)
4. Emphasize hands-on learning
5. Prepare students to be marketable
6. Be marketable (as a program)
7. Be connected/integrated to industry
8. Be individualized
9. Be college-level with remedial services
10. Be based on industry needs
11. Be placement driven
12. Be fun
13. Be interesting
14. Be structured for accreditation
15. Be student/user/learner friendly
16. Be accessible (student diversity, cultural diversity, gender diversity, pluralism)
17. Be a balanced education (skills, values, & knowledge)
18. Be ongoing (life-long learning, renewable, updateable)
19. Be a lifetime experience/lifelong placement (doesn't abandon the person)
20. Be thinking-oriented (i.e., no one correct way to solve a problem)
21. Have a positive image
22. Prepare technicians not operators
23. Be taught by qualified and experienced people
24. Be taught by qualified teachers (good instructors)
25. Be beneficial to the community (impact to society)
26. Be affordable (time and money)
27. Be supportive/proactive of cultural, ethnic, gender diversity
28. Be presented and learned in articulated sequences (progression & program continuity)
29. Be job-related instructional experiences
30. Be as challenging as the jobs are
31. Be on the leading edge of technology
32. Provide adequate counseling (personal and educational)
33. Provide comprehensive needs assessment for students
34. Have flexible schedules (for full-time and part-time students)
35. Have flexible programming and completing of the program
36. Be transferable to advanced degrees or other institutions
37. Be able to explore other fields beyond your major
38. Be anticipatory of change (proactive rather than reactive)
39. Be concentrated in content and time
40. Provide communication skills (all forms)
41. Provide available housing
42. Be validated by industry
43. Be customer relation supportive/service oriented
44. Be accommodating to learning styles
45. Be a part of all education
46. Prepare students to be computer literate
47. Provide day care (low cost - on or off site)
48. Provide highly attractive work force to attract business to the area
49. Provide on-the-job training (internship)

50. Provide tools to elementary and secondary personnel to recognize vocational education as an equal alternative

51. Be a positive alternative to college

52. Have links to the community

53. Prepare students to work anywhere (including internationally)

54. Provide state of the art, well maintained facilities & equipment

55. Have student-centered instructors

56. Be fully-supported by all divisions within the school

57. Provide job placement

58. Include safety training

59. Be cost effective for students (salary/education cost)

60. Have clearly defined admission standards

61. Hold students accountable (attendance, scholastic & professional standards, etc.)

62. Set an example of excellence for other types of education

63. Be team oriented & problem solving

64. Be on the A team; none on the B team/all students treated equitably

65. Provide constant staff review, renewal & upgrading

66. Teach business ethics

67. Be ethical

68. Provide a sense of accomplishment (student satisfaction)

69. Pay better

70. Provide ability to move from employee to employer

71. Encourage female enrollment (dispel stereotype of vo-techs as male dominated)

72. Provide affordable food service

73. Make available all school activities

74. Provide feedback to alumni on performance

75. Use advisory committees

76. Provide services (consultation & professional services) to industry

77. Enrich the lives of the stakeholders

78. Address social issues

79. Should not promote professional prejudice

80. Recruit (be pursued by) more people

81. Participate in research programs

82. Be research-driven (applied research)

83. Be reimburseable by employers

84. Provide recreational center

85. Provide for financial aid

86. Provide scholarships for financial achievement

87. Create a desire to learn

88. Support entrepreneurship

89. Facilitate/collaborate/provide a meeting point between industry, education & government)

90. Provide communication/ articulation between levels of technical career

91. Be accountable to industry and students

92. Provide a smooth flow from secondary to postsecondary education

93. Bring together labor and management

94. Foster leadership

95. Fit with contemporary, corporate management revolutions/strategies (i.e., TQM, bottoms-up approach)

96. Have measurable outcomes

97. Have a clear mission/be visionary

98. Attract the best students

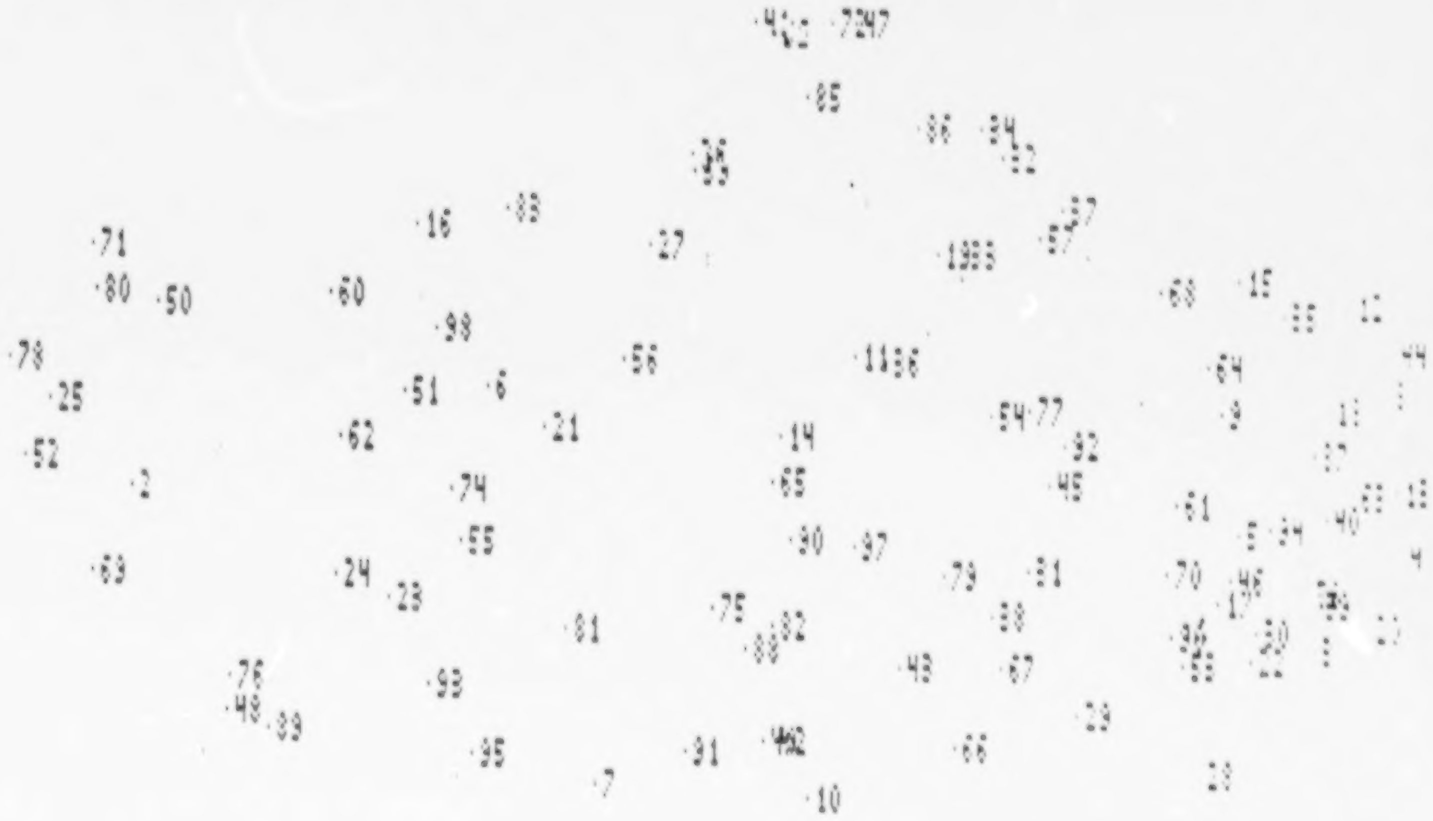
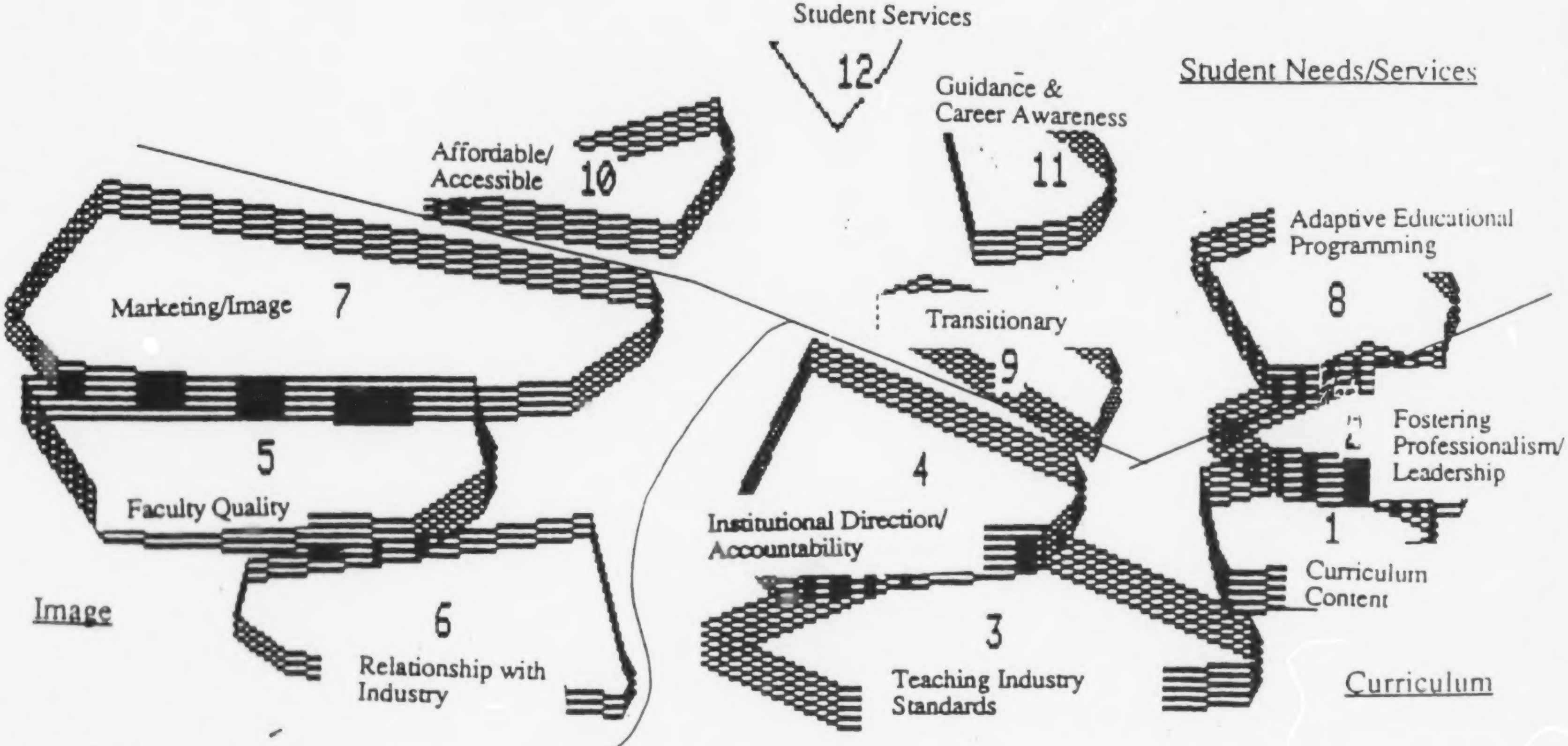


Figure 3. Number Point Map for Brainstormed Statements from the Proprietary Institute


Student Services
12
Student Needs/Services
Guidance & Career Awareness
11
Affordable/ Accessible
10
Adaptive Educational Programming
8
Marketing/Image
7
Transitionary
9
Fostering Professionalism/ Leadership
2
4
5
Faculty Quality
Institutional Direction/ Accountability
1
Curriculum Content
Image
6
3
Relationship with Industry
Teaching Industry Standards
Curriculum

Level	Value
1	2.11 to 2.52
2	2.52 to 2.94
3	2.94 to 3.35
4	3.35 to 3.76
5	3.76 to 4.17

Figure 4. Cluster Priority Rating Map of Vocational Education for the Proprietary Institute

Table 5
Brainstormed Statements and Priority Ratings Grouped by Cluster for the Proprietary Institute

Cluster 1 - Curriculum Content

1. Be up to date (cutting edge) curriculum (4.67)
96. Have measurable outcomes (4.10)
22. Prepare technicians not operators (4.14)
53. Prepare students to work anywhere (including internationally) (3.67)
3. Be pertinent to a specific curriculum (focused/customized) (4.29)
30. Be as challenging as the jobs are (4.14)
20. Be thinking-oriented (i.e., no one correct way to solve) (4.57)
39. Be concentrated in content and time (3.48)
58. Include safety training (3.86)
17. Be a balanced education (skills, values, & knowledge) (4.19)
46. Prepare students to be computer literate (4.00)
70. Provide ability to move from employee to employer (3.67)

Cluster average = 4.06

Cluster 2 - Fostering Professionalism/Leadership

4. Emphasize hands-on learning (4.71)
13. Be interesting (3.67)
63. Be team oriented and problem solving (3.76)
40. Provide communication skills (all forms) (3.90)
87. Create a desire to learn (4.38)
5. Prepare students to be marketable (4.52)
94. Foster leadership (4.00)
61. Hold students accountable (attendance, scholastic & professional standards, etc.) (4.43)

Cluster Average = 4.17

Cluster 3 - Teaching Industry Standards

10. Be based on industry needs (4.57)
42. Be validated by industry (3.81)
49. Provide on-the-job training (internship) (3.62)
91. Be accountable to industry and students (4.14)
28. Be presented and learned in articulated sequences (progression &.) (3.62)
29. Be job-related instructional experiences (3.86)
66. Teach business ethics (3.48)
43 Be customer relation supportive/service oriented (3.67)
67. Be ethical (4.00)

Cluster Average = 3.86

Cluster 4 - Institutional Direction/Accountability

14. Be structured for accreditation (3.90)
65. Provide constant staff review, renewal & upgrading (4.00)
90. Provide communication/articulation between levels of technical careers (2.90)
97. Have a clear mission/be visionary (4.24)
31. Be on the leading edge of technology (4.33)
79. Should not promote professional prejudice (3.33)
38. Be anticipatory of change (prospective rather than reactive) (3.57)
75. Use advisory committees (3.10)

82. Be research-driven (applied research) (3.71)
88. Support entrepreneurship (3.71)

Cluster Average = 3.61

Cluster 5 - Faculty Quality

2. Be a ticket to a pay check (3.90)
52. Have links to the community (3.57)
69. Pay better (2.81)
23. Be taught by qualified and experienced people (4.57)
24. Be taught by qualified teachers (good instructors) (4.71)
55. Have student-centered instructors (4.14)
74. Provide feedback to alumni on performance (3.10)

Cluster Average = 3.83

Cluster 6 - Relationship with Industry

7. Be connected/integrated to industry (4.38)
95. Fit with contemporary, corporate management revolution (3.14)
81. Participate in research programs (3.05)
93. Bring together labor and management (2.71)
48. Provide highly attractive work force to attract business to the area (3.24)
89. Facilitate/collaborate/provide a meeting point between industry, education & government (3.10)
76. Provide services (consultation & professional services to industry) (3.33)

Cluster Average - 3.28

Cluster 7 - Marketing/Image

6. Be marketable (as a program) (3.76)
51. Be a positive alternative to college (4.29)
21. Have a positive image (4.14)
62. Set an example of excellence for other types of education (3.81)
56. Be fully-supported by all divisions within the school (3.57)
60. Have clearly defined admission standards (3.86)
98. Attract the best students (3.81)
25. Be beneficial to the community (impact to society) (3.52)
78. Address social issues (2.57)
50. Provide tools to elementary and secondary personnel to recognize vocational education as an equal alternative (3.86)
80. Recruit (be pursued by} more people (3.29)
71. Encourage female enrollment (dispel stereotype of vo-techs as male dominated) (3.43)

Cluster Average - 3.66

Cluster 8 - Adaptive Educational Programming

8. Be individualized (2.86)
18. Be ongoing (life-long learning, renewable, updateable) (3.95)
44. Be accommodating to learning styles (3.52)
9. Be college-level with remedial services (3.38)
64. Be on the A team; none on the B team/all students treated equitably (3.19)
12. Be Fun (2.90)
35. Have flexible programming and completing of the program. (3.10)
15. Be student/user/learner friendly (3.86)

68. Provide a sense of accomplishment (student satisfaction) (3.90)

Cluster Average = 3.41

Cluster 9 - Transitionary

11. Be placement driven (4.14)
36. Be transferable to advanced degrees or other institutions (3.76)
45. Be a part of all education (3.10)
92. Provide a smooth flow from secondary to postsecondary education (3.48)
54. Provide state of the art, well maintained facilities & equipment (4.43)
77. Enrich the lives of the stakeholders (2.80)

Cluster Average 3.62

Cluster 10 - Affordable/Accessible

16 Be accessible (student diversity, cultural diversity, gender diversity, pluralism) 3.57)
83. Be reimburseable by employers (3.33)
27. Be supportive/proactive of cultural, ethnic, gender div.. (3.14)
26. Be affordable (time and money) (3.86)
59. Be cost effective for students (salary/education costs) (3.67)

Cluster Average = 3.512

Cluster 11 - Guidance & Career Awareness

19. Be a lifetime experience/lifelong placement (doesn't abandon the person) (3.71)
33. Provide comprehensive needs assessment for students (3.30)
37. Be able to explore other fields beyond your major (2.57)
57. Provide job placement (4.43)
32. Provide adequate counseling (personal and educational) (3.38)
34. Have flexible schedules (for full-time and part-time students) (3.10)
86. Provide scholarships for financial achievement (3.71)

Cluster Average = 3.46

Cluster 12 - Student Services

41. Provide available housing (1.57)
73. Make available all school activities (1.86)
84. Provide recreational center (1.48)
47. Provide day care (low cost -- on or off site) (2.10)
72. Provide affordable food service (1.86)
85. Provide for financial aid (3.81)

Cluster Average = 2.11

Table 7

Brainstormed Statements from the Public Technical College (n=86)

1. Be a lifelong experience
2. Be more focused on actual job experience
3. Lead to employment
4. Be reflective of community employment needs (involving communication between education and employers)
5. Provide vocational skill development
6. Be focused on individual career paths
7. Have current knowledge and skills
8. Provide students with hands-on experience
9. Develop responsible workers
10. Provide financial support (i.e., federal, state) for day care
11. Provide support services (i.e., day care, counseling, etc.) at all times of day
12. Use state of the art technology
13. Prepare students to be productive citizens in a democratic society
14. Provide career exploration
15. Provide faster and more efficient registration
16. Provide lower book prices or a rental system for books
17. Result in self-actualization (maximize the individual)
18. Result in career advancement (promotion)
19. Be open to all (accessible)
20. Provide a qualified workforce
21. Provide transferable credit to other institutions
22. Enhance careers and enrich jobs
23. Prepare students to be problem solvers/critical thinkers
24. Be recognized as a first-class education
25. Provide adequate parking
26. Raise self esteem (positive self image)
27. Support academic, technical, and social needs of students (nontraditional as well as traditional)
28. Provide flexible instruction to meet retraining needs
29. Be affordable
30. Use alternative delivery systems for instruction (e.g., ITV, telecourses)
31. Be varied in instructional methodology
32. Provide employable skills at a living wage
33. Provide longer classes with fewer students for difficult/major subjects
34. Be planned to meet educational goals of students
35. Be comprehensive (provide a basic broad general education foundation)
36. Provide the opportunity for remedial education
37. Include, use, and build on basic skills
38. Provide faculty that are patient and understanding of student needs
39. Be designed to be of appropriate length to meet the needs of its clients (industry and students)
40. Provide adequate time and resources for faculty and staff professional development
41. Provide adequate time for faculty to engage in research, study, exploring changing technology, and curriculum development
42. Provide transitional services from high school, college to the workforce and back again for retraining as needed
43. Include more business/industry people in instruction
44. Be comprehensive at the institutional level in education and systems
45. Provide for the development of leadership, interpersonal skills, and team building
46. Focus on environment which focuses on quality teaching and learning
47. Promote faculty involvement in the community
48. Require instructors to participate in hands-on continuing education in their program area

49. Identify economic development needs and provide services to meet those needs
50. Provide financial support in a timely fashion
51. Provide smoking area
52. Be competency-based and outcomes-oriented
53. Be adequately funded
54. Be proactive in the political process
55. Be sensitive to taxpayers' ability to support the system
56. Provide adequate facilities (bathrooms, study rooms)
57. Provide more extracurricular and school-related activities
58. Be worth going to (meaningful)
59. Use practical skill assessment
60. Work in partnership with other educational institutions to develop articulation initiatives (i.e., 2+2, Tech Prep)
61. Incorporate quality concepts (TQM) in all aspects of its instructional programs
62. Have sufficient resources (time, staff, materials) to meet established goals and priorities
63. Encompass adequate assessment and developmental opportunities from intake to exit
64. Help students set and achieve realistic educational goals
65. Avoid duplication of resources
66. Require courses or integrate ethics in the curriculum
67. Provide internships, job shadowing, and mentoring
68. Give more weight to community input
69. Include business/industrial partnerships
70. More available and affordable housing
71. Have more classes where there is high demand
72. Have more contact with counselors/advisors
73. Prepare students to meet occupational, licensure and certification standards
74. Enhance life skills (i.e. understanding of self, social and economic settings, coping with conflict and change, recreational activities, student government, and fun)
75. Provide a bridge between theory and practice/application
76. Be in touch with what happens in real work world (coop programs)
77. Teach students how to learn
78. Teach students terminology of their fields
79. Empower faculty and staff to make decisions at the lowest level (scheduling, curriculum outcomes, quality instruction, etc.)
80. Encourage nontraditional employment
81. Provide for specific occupational training
82. Develop an image of respect for vocational education
83. Provide a comfortable physical environment for learning
84. Provide orientation for single parents
85. Be required
86. Guarantee job retraining

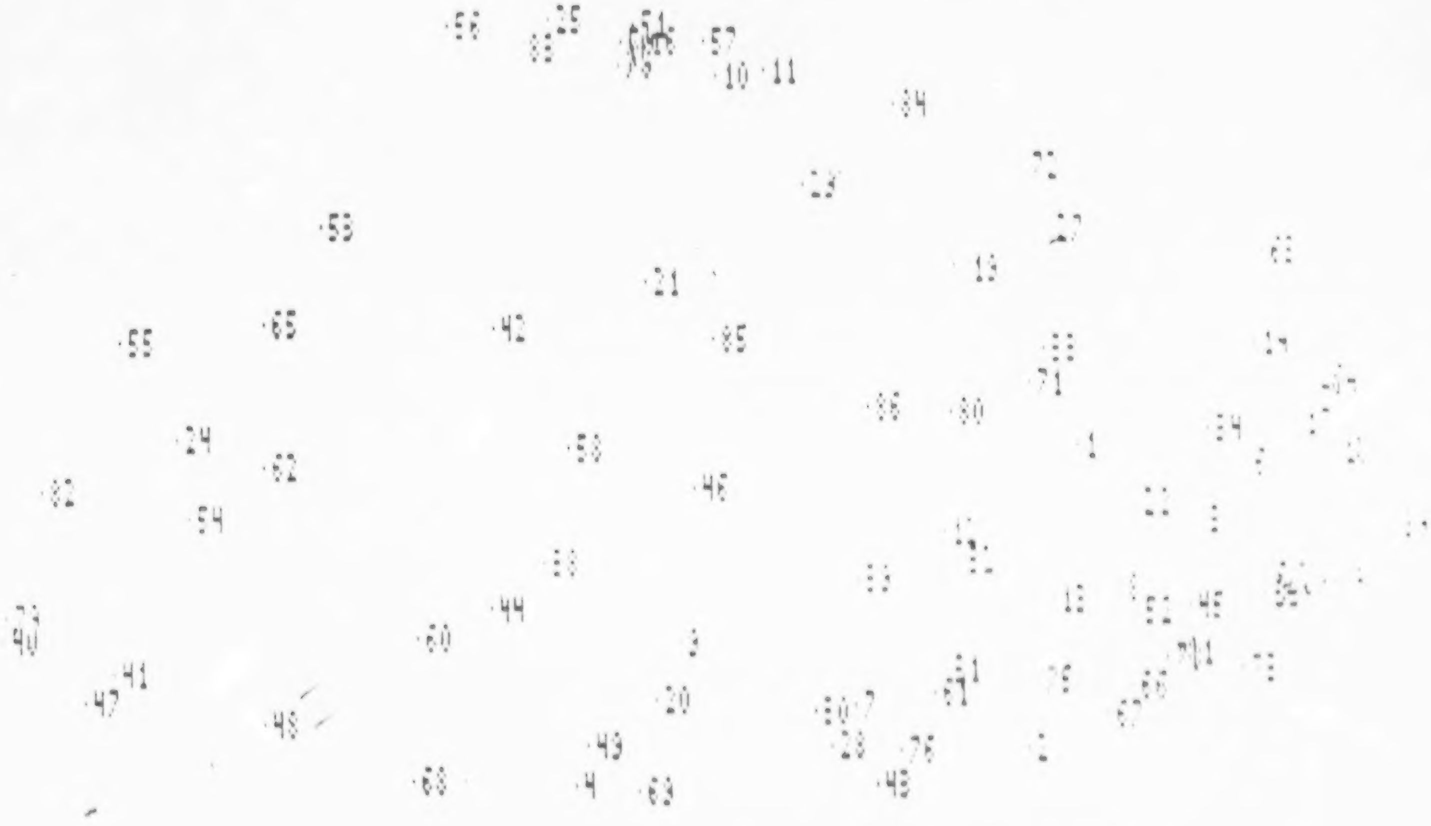
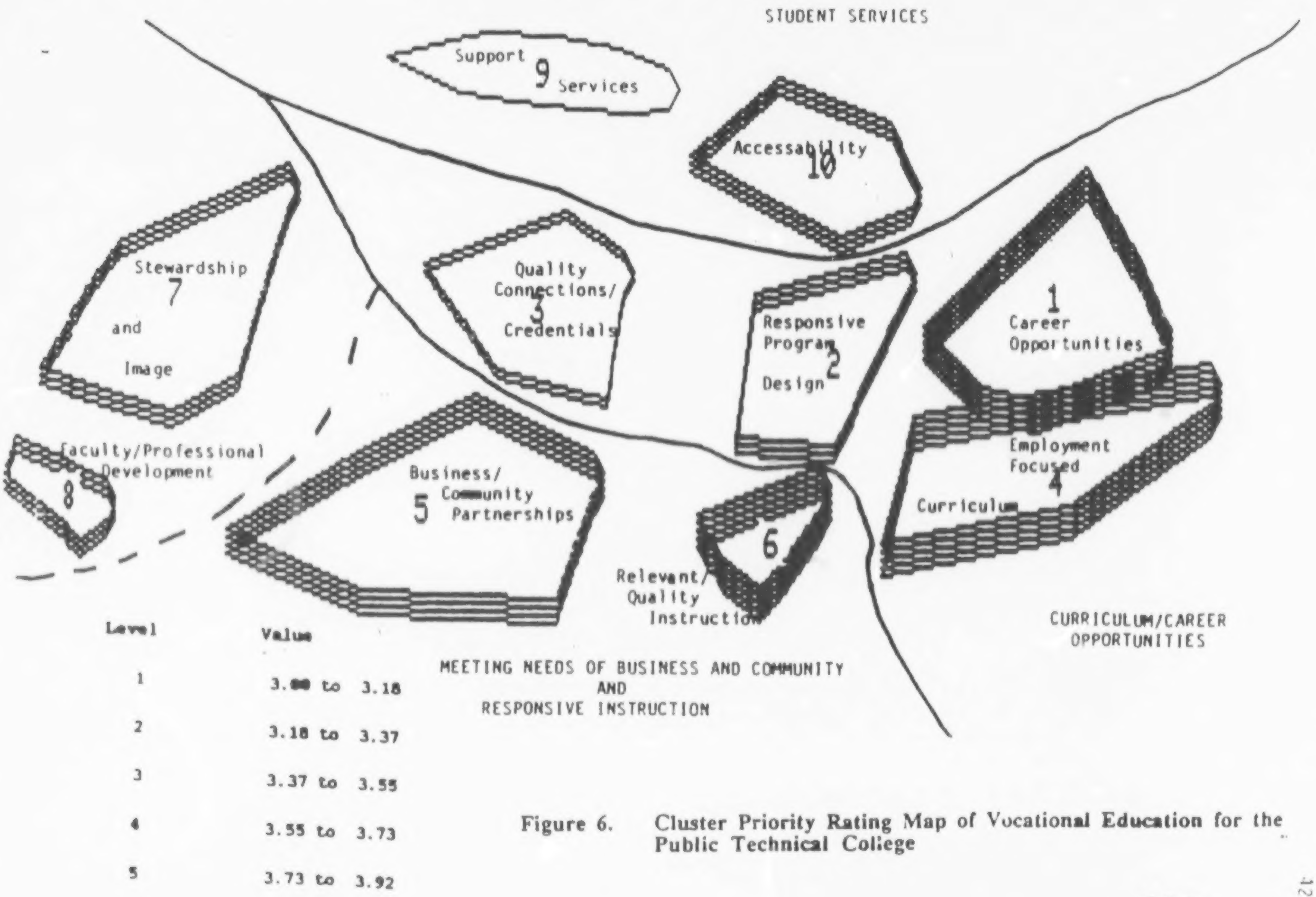


Figure 5. Number Point Map for Brainstormed Statements from the Public Technical College


STUDENT SERVICES
Support 9 Services
Accessability 10
Stewardship 7 and Image
Quality Connections/ 3 Credentials
Responsive Program 2 Design
1 Career Opportunities
Faculty/Professional Development 8
Business/ Community 5 Partnerships
Employment Focused 4 Curriculum
6 Relevant/ Quality Instruction
CURRICULUM/CAREER OPPORTUNITIES
MEETING NEEDS OF BUSINESS AND COMMUNITY
AND
RESPONSIVE INSTRUCTION

Level	Value
1	3.00 to 3.18
2	3.18 to 3.37
3	3.37 to 3.55
4	3.55 to 3.73
5	3.73 to 3.92

Figure 6. Cluster Priority Rating Map of Vocational Education for the Public Technical College

Table 8
Brainstormed Statements and Priority Ratings Grouped by Cluster for the Public Technical College

Cluster 1 - Career Opportunities

1. Be a lifelong experience (3.95)
6. Be focused on individual career paths (3.81)
34. Be planned to meet educatiuonal goals of students (3.76)
3. Lead to emplyment (4.71)
22. Enhance careers and enrich jobs (4.05)
17. Result in self-actualization (maximize the individual) (3.65)
18. Result in career advancement (promotion) (4.00)
74. Enhance life skills (i.e. understanding of self, social and economic settings, coping with conflict and change, recreational activities, student government, and fun) (3.76)
14. Provide career exploration (3.14)
26. Raise self esteem (positive self image) (3.95)
64. Help students sets and achieve realistic educational goals(3.90)
63. Encompass adequate assessment and development opportunities from intake to exit (3.81)

Cluster Average = 3.88

Cluster 2 - Responsive Program Design

12. Use state of the art technology (3.81)
32. Provide employable skills at a living wage (3.76)
39. Be designed to be appropriate length to meet the needs of its clients (industry and students) (3.86)
33. Provide longer classes with fewer students for difficult/major subjects (3.05)
71. Have more classes where there is high demand (3.24)
80. Encourage nontraditional employment (3.29)
86. Guarantee job retraining (3.00)

Cluster Average = 3.43

Cluster 3 - Quality Connections/Credentials

21. Provide transferable credit to other institutios (3.90)
85. Be required (2.10)
42. Provide transitional services from high school, college to the workforce and back agbain for retraining as needed (3.14)
46. Focus on environment which focuses on quality teaching and learning (3.48)
58. Be worth going to (meaningful) (3.95)

Cluster Average = 3.31

Cluster 4 - Employed-focused Curriculum

2. Be more focused on actual job experience (4.24)
66. Require courses or integrate ethics in curriculum (3.45)
67. Provide internships, job shadowing, and mentoring (3.33)
75. Provide a bridge between theory and practice/application (4.29)
8. Provide students with hands-on experience (4.29)
52. Be competency-based and outcomes-oriented (4.05)
45. Provide for the development of leadership, interpersonal skills, and team building (3.90)
13. Prepare students to be productive citizens in a democratic society (3.38)
73. Prepare students to meet occupational, licensure and certification standards (4.10)
78. Teach students terminology of their fields (3.67)
81. Provide for specific occupational training (4.38)
5. Provide vocational skills development (3.76)

23. Prepare students to be problem solvers/critical thinkers (4.38)
35. Be comprehensive (provide a basic broad education foundation) (3.67)
77. Teach students how to learn (4.24)
37. Include, use, and build on basic skills (3.90)
36. Provide the opportunity for remedial education (3.76)
59. Use practical skill assessment (3.76)

Cluster Average = 3.92

Cluster 5 - Business/Community Partnerships

4. Be reflective of community employment needs (4.05)
69. Include business/industrial partnerships (3.24)
49. Identify economic development needs and provide (3.05)
9. Develop responsible workers (4.10)
20. Provide a qualified workfore (4.29)
48. Require instructors to participate in hands-on cont.. (3.62)
68. Give more weight to community input (3.62)
38. Provide faculty that are patient and understanding (3.90)
44. Be comprehensive at the institutional level in education and systems (3.05)
60. Work in partnership with other educational institions to develop articulation initiatives (i.e., 2+2, Tech Prep) (3.95)

Cluster Average = 3.69

Cluster 6 - Relevant/Quality Instruction

7. Have current knowledge and skills (4.57)
30. Use alternative delivery systems for instruction (e.g., ITV, telecourses) (3.14)
28. Provide flexible instruction to meet retraining need (4.00)
43. Include more business/industry people in instruction (3.48)
76. Be in touch with what happens in real world (coop programs) (3.95)
31. Be varied in instructional methodology (3.62)
61. Incorporate quality concepts (TQM) in all aspect (3.76)

Cluster Average = 3.79

Cluster 7 - Stewardship & Image

24. Be recognized as a first-class education (3.33)
62. Have suffient resources (time, staff, materials) to meet established goals and priorities (4.19)
54. Be proactive in the political process (2.71)
82. Develop an image of respoect for vocational education (3.19)
53. Be adequately funded (3.71)
55. Be sensitive to taxpayers' ability to support the system (3.05)
65. Avoid duplication of resources (3.48)

Cluster Average = 3.38

Cluster 8 - Faculty/Professional Development

40. Provide adequate time and resources fo faculty and staff development (3.86)
79. Empower faculty and staff to make decisions at the lowest level (scheduling, curriculum outcomes, quality instruction, etc.) (3.33)
41. Provide adequate time for faculty to engage in research (3.43)
47. Promote faculty involvement in the community (3.38)

Cluster Average = 3.50

Cluster 9 - Support Services

10. Provide financial support (i.e. federal, state) for day care (3.38)
11. Provide support services (i.e., day care, counseling, etc.) at all times of day (3.62)
57. Provide more extracurricular and school-related activities (3.00)
15. Provide faster and more effiecient registration (3.10)
70. More available and affordable housing (2.33)
16. Provide lower book prices or a rental system for books (3.38)
50. Provide financial support in a timely fashion (2.71)
51. Provide a smoking area (2.29)
25. Provide adequate parking (3.14)
83. Provide a comfortable physical environment for learning (3.24)
56. Provide adequate facilities (bathrooms, study rooms) (2.76)

Cluster Average = 3.00

Cluster 10 - Accessibility

19. Be open to all (accessible) (4.10)
27. Support academic, technical, and social needs of students (nontraditional as well as traditional) (3.86)
72. Have more contact with counselors/advisors (3.95)
29. Be affordable (3.67)
84. Provide orientation for single parents (2.14)

Cluster Average = 3.54

SURVEY OF TEACHERS' IMPLEMENTATION AND PERCEPTION OF AGRISCIENCE AND NATURAL RESOURCE CURRICULUM

James J. Connors
Jack Elliot

Department of Agricultural Education
The University of Arizona
Forbes 222A
Tucson, Arizona 85721

Paper presented at the annual meeting of the
American Education Research Association

April 1993
Atlanta, GA

SURVEY OF TEACHERS' IMPLEMENTATION AND PERCEPTIONS OF AGRISCIENCE AND NATURAL RESOURCES CURRICULUM

James J. Connors
Jack Elliot

Department of Agricultural Education
The University of Arizona
Tucson, Arizona

INTRODUCTION

Since its inception in 1917, vocational agricultural education has prepared students for entry and advancement in agricultural related occupations. However, as production agriculture has changed, so has vocational agricultural education. With fewer people working in production agricultural jobs, vocational agricultural education has expanded its mission to include using agricultural and natural resources principles to teach science concepts to high school students.

Iverson and Robinson (1990) stated, "An integrated agricultural science and technology program ...is based on quality standards that transcends general, academic and vocational lines, and that replaces traditional vocational agriculture programs" (p. 21). Kirby (1990) went so far as to say "Teachers have incorporated agriscience projects, some of an experimental nature to assist students in developing thinking and science skills."

PURPOSE AND OBJECTIVES

The purpose of this study was to determine teachers' implementation and perceptions of the Michigan Agriscience and Natural Resources Curriculum. Specific objectives included:

1. To determine the percentage of the science objectives in the Michigan Agriscience and Natural Resources Curriculum that teachers cover in their classroom.
2. To determine Michigan agriscience and natural resources educators' perceptions of the use of agricultural principles to teach science.

THEORETICAL FRAMEWORK

The past decade has seen many calls for educational reform in the United States. Parents, teachers, business leaders, and educational professionals have all called for new and innovative approaches to teaching English, mathematics, and science. Agricultural education in the United States is responding to this need by placing more emphasis on teaching scientific principles using agricultural and natural resources concepts. The National Research Council (1988) in its report, "Understanding Agriculture: New Directions for Education" stated, "Teaching science through agriculture would incorporate more agriculture into curricula, while more effectively teaching science." Michigan agricultural education programs addressed this issue by replacing the production agriculture curriculum with a new agriscience and natural resources curriculum.

Moss (1984) studied agricultural education programs in North Carolina and found, "twenty-four (24) of the 60 competencies in the Introduction to Agriculture/Natural Resources course were identified as being similar to competencies taught in high school courses such as Biology, Earth Science, and Physical Science." In Michigan, the Michigan Agriscience and Natural Resources (ANR) Curriculum was cross referenced with the State Science Objectives as determined by the Michigan Department of Education (State Administrative Board, 1990). All objectives of the Michigan ANR curriculum matched objectives of the State Science Objectives.

This research was built on the theoretical framework that agriscience and natural resources educators' implementation of new curriculum materials is related to their perceptions of the new curriculum. Teacher attitudes about the new agriscience and natural resources curriculum are important to the success of the implementation process. Pepple (1982) studied factors associated with teacher use and effectiveness of the Illinois Rural Core Curriculum in Agriculture. The study found that the core curriculum influenced teachers to use a greater variety of classroom instructional methods (Pepple, 1982). Norris and Briers (1989) reported:

> Teachers' perceptions toward the change process (need for the change, manner in which the change was managed, amount of teacher input into the change, etc.) was the single best indicator of teachers' free choices and actual decisions concerning adoption of the change.

Peasley and Henderson (1991) conducted a descriptive study of teacher use, attitudes, and knowledge of agriscience curriculum in Ohio. Peasley and Henderson found 25% of the teachers were teaching more than 75% of the content objectives of the Ohio agriscience curriculum. This result led the researchers to state, "High school teachers of production agriculture in Ohio are teaching a moderate level of the agriscience content." However, the researchers concluded that "Ohio high school teachers of production agriculture could be described as having a positive attitude toward the notion of an agriscience core curriculum and the term agriscience (Peasley and Henderson, 1991)."

METHODOLOGY

This study was a descriptive survey research study. A questionnaire was developed to determine the amount of the Michigan Agriscience and Natural Resources Curriculum educators were implementing in their classrooms and their perceptions of the new curriculum. The questionnaire contained four parts. Part I contained 70 objectives from Units 100, 200, and 300 of the Michigan Agriscience and Natural Resources Curriculum. Michigan agriscience and natural resources educators were asked to indicate whether or not they taught each of the 70 objective in their agriscience and natural resources classes. ANR teachers in horticulture programs indicated whether or not they taught 27 objectives in units 100 and 200, Natural Resources and Michigan Agriculture and Plant Science.

Part II used a seven-point semantic differentiation scale to determine Michigan agriscience and natural resources educators' attitudes towards the concept of agriscience. Thirteen pairs of adjectives were included to determine if respondents had a negative or positive attitude towards agriscience.

Part III contained 11 Likert scale questions used to determine Michigan agriscience and natural resources educators' perceptions of agriscience and natural resources as an alternative to production agriculture programs. Part IV contained 12 demographic questions about respondents gender, age, race, years of teaching, and program characteristics.

The content validity of the instrument was also verified by a panel of experts familiar with agriscience and natural resources education. The instrument was checked for reliability with a sample of Michigan agriscience and natural resources educators. Reliability was calculated using the Statistical Package for the Social Sciences (SPSS/PC+). Cronbach's alpha coefficients ranged from .72 to .95. Non-response error was controlled by following the Total Design Method (Dillman, 1978). Early respondents were compared to late respondents on their responses to survey questions. No significant differences existed between early and late respondents.

POPULATION

The target population for the descriptive survey was all Michigan agriscience and natural resources educators. Because there were only 140 agriscience and natural resource educators in Michigan during 1991-92, a census of all educators was conducted. The survey had a final response rate of 122 teachers, or 87% of the population.

RESULTS

The survey found that all Michigan agriscience and natural resources educators were teaching 81% of the science objectives included in the Michigan Agriscience and Natural Resources Curriculum. ANR teachers who taught in primarily agriscience and natural resources programs were teaching 83% of the science objectives in Units 100, 200, and 300 of the curriculum. ANR teachers who taught in primarily horticultural programs were teaching 79% of the science objectives in Units 100 and 200 of the curriculum. Fifty percent of the teachers were teaching at least 50% of the science objectives of the curriculum. Table 1 shows the percentage of Michigan agriscience and natural resources objectives taught by ANR teachers.

Table 1

Percentage of Michigan Agriscience and Natural Resources Curriculum objectives taught

Group	Mean	S.D.	Min.	Max.
All Respondents (n=108)	82%	17%	0	100%
ANR teachers (n=80) (not including hort.)	83%	18%	0	100%
ANR teachers (n=28) (horticulture only)	79%	16%	44%	100%

The percentage of objectives taught was also placed into quartiles for reporting purposes. The largest percentage of all three groups taught between 75 and 100% of the curriculum objectives. Table 2 shows the number and percentage of respondents in each quartile.

Semi-partial regression of the percentage of science objectives taught on the independent variables found that both the demographic variables of the teachers, and ANR program variables to be significant. Table 3 shows the results of the semi-partial regression.

Table 2

Percentage of Michigan Agriscience and Natural Resources Curriculum objectives taught

Percent	ANR (except hort.)		ANR (hort. only)		All Teachers	
	N	%	N	%	N	%
1 - 25%	1	1.3	0	0.0	1	0.9
26 - 50%	3	3.8	3	10.7	6	5.6
51 - 75%	13	16.3	8	28.6	21	19.4
76- 100%	63	78.8	17	60.7	80	74.1
Totals	80	100.0	28	100.0	108	100.0

Table 3

Semi-partial regression coefficients for independent variable sets with percentage of science objectives taught by teachers

Variable Set	sR^2	F
Demographic variables	.56	5.27 *
Independent variables	.12	4.37 *
Total	.68	4.37 *

* $p<.05$

Multiple regression analysis found that schools located in towns or rural areas, and the hours of in-service workshops teachers had attended to be significant variables in the equation. Table 4 displays the results of the multiple regression.

Table 4

Multiple regression of the percentage of science objectives taught by teachers on their independent variables

Independent Variables	Beta (β)	t value
Intercept	.31	.759
Demographic variables		
Age	-.01	-1.522
Gender	-.08	-.870
Urban schools	-.09	-.526
Town schools	.41	3.078*
Rural schools	.26	2.455*
Years taught	.01	1.607
Program variables		
Program restructured	-.00	-.103
Hours of in-service	.00	2.233*
Restructuring committee	.16	.835
Science certification	.10	.580

* $p<.05$
$R^2 = .68$

Part II of the questionnaire included thirteen pairs of adjectives in a semantic differentiation scale. Michigan agriscience and natural resources teachers had a slightly positive attitude towards the concept of "agriscience." The mean score for all teachers on the semantic differential scale was 5.70 with a standard deviation of .97.

Table 5

Semantic differentiation statistics for teachers' attitudes about agriscience

Descriptor	Mean	Category
Bad/good	6.21	Strong Positive
Unimportant/important	6.10	
Worthless/valuable	5.91	
Unnecessary/necessary	5.90	
Unessential/essential	5.85	
Archaic/innovative	5.66	
Ineffective/effective	5.62	
Boring/exciting	5.61	
Static/dynamic	5.61	
Dispensable/indispensable	5.54	
Doubtful/sure	5.45	Slight Positive
Old/new	5.38	
Unwanted/wanted	5.37	

Teachers' perceptions of the agriscience and natural resources curriculum was measured on a five point Likert scale with rankings from 1 (strongly disagree) to 5 (strongly agree). The mean for all respondents was 4.18, with a standard deviation of .48. Respondents strongly agreed that ANR courses should receive high school science credit. Respondents disagreed that traditional production agriculture programs were better than agriscience and natural resources programs. Results of the Likert scale questions are located in Table 6.

Table 6

Statistics for Likert scale questions on teachers' perceptions of agriscience and natural resources

Question		Mean	S.D.	Descriptor
1.	An ANR program in high school will give students a solid base for a career in agriculture and natural resources.	4.38	.68	Agree
2.	An ANR course should be recommended to all high school students.	3.92	1.01	Agree
3.	High school science credit should be awarded for ANR courses.	4.73	.48	Strongly Agree
4.	My community supports the concept of agriscience and natural resources.	4.12	.83	Agree
5.	Teaching an ANR curriculum enables me to more effectively meet the needs of my students.	4.05	.86	Agree
6.	An ANR curriculum attracts a diverse group of students.	3.95	.98	Agree
7.	I am a supporter of the change to agriscience and natural resources programs.	4.29	.88	Agree
8.	I believe that traditional production agriculture programs are better than agriscience and natural resources programs.	2.06	.89	Disagree
9.	There is evidence to support the change to an ANR based curriculum.	4.11	.74	Agree
10.	An ANR program is appropriate for my community.	4.22	.74	Agree
11.	ANR programs should be placed in the science department of high schools.	3.99	1.04	Agree

Teacher knowledge of the Michigan Agriscience and Natural Resources Curriculum project was measured on a 10 question test. Teachers were instructed to read a statement about the Michigan ANR Curriculum and mark the statement true and false. Teachers received one point for each correct response. Results indicated that the teachers had a mean score of 6.43. The scores ranged from four to 10. The largest group of respondents had a score of six on the 10 point test. Only 6.5% of the teachers had a score of nine or higher.

Michigan agriscience and natural resources educators also provided comments pertaining to the Michigan Agriscience and Natural Resources Curriculum. Comments were placed into positive, negative, and general categories. A sample of educators' comments follows:

Positive Comments

"The idea of restructuring is great, however, there is FAR too much paper work to be done."

"The Content of the new curriculum is great, but I need help in actually effectively implementing the content into the everyday classroom."

Negative Comments

"1. Time. Time. Time 2. May need a booster shot to get restructuring program off the ground."

"The process is very lengthy and time consuming. I know it is useful and constructive to do an internal evaluation but there simply not enough hours in the day to get everything done. It seems to be alot of open pushing, needlessly. Simply, give me the curriculum and let me teach."

General Comments

"What will happen to the restructuring & implementation of the new curriculum now that university support people are gone? Have we been railroaded again?"

"* Agriscience is only as good as the instructor."

CONCLUSIONS

Based on the findings of this survey, the following conclusions were formed:

1. Michigan ANR teachers are teaching a large percentage of the objectives of the Michigan Agriscience and Natural Resources Curriculum. Over 78% of the Michigan agriscience and natural resources teachers and 60% of Michigan horticulture teachers cover at least 75% of the science objectives of the Michigan Agriscience and Natural Resources Curriculum.

2. Michigan agriscience and natural resources and horticulture teachers had a slightly positive attitude towards the concept of "agriscience." They agreed that the curriculum is useful and should be recommended to all high school students.

3. Michigan agriscience and natural resources teachers only had an average knowledge of the Michigan ANR curriculum development project activities.

4. There was no significant differences in the percent of ANR objectives taught between programs that have completed restructuring and those that have not completed restructuring.

RECOMMENDATIONS

1. In-service and technical update sessions should be planned to assist teachers with developing instructional lesson plans that incorporate more objectives of the Michigan ANR Curriculum.

2. Teachers should be encouraged to attend professional development training and incorporate more hands-on activities into the curriculum.

3. Greater emphasis needs to be placed on disseminating curriculum development information to all Michigan agriscience and natural resources teachers.

4. Results of this study should be reviewed by other states considering curriculum changes. Additional research is recommended that would determine the factors that effect the decision why programs chose to restructure to become agriscience and natural resources programs.

REFERENCES

Dillman, D.A. (1978). Mail and telephone surveys: the total design method. New York: John Wiley & Sons.

Moss, J. (1984). Teaching science in vocational agriculture: an identification of science competencies taught in Ornamental Horticulture and Introduction to Agriculture/Natural Resources. (ERIC Document Reproduction Service No. ED 267 251)

National Research Council (1988). Understanding Agriculture: New Directions for Education. Washington D.C.: National Academy Press.

Norris, R. J. & Briers, G. E. (1989). Perceptions of secondary agricultural science teachers toward proposed changes in agricultural curricula in Texas. Journal of the American Association of Teacher Educators in Agriculture. 30(1), pp. 32-43, 59.

Peasley, D. & Henderson, J. (1991, June). Agriscience curriculum in Ohio agricultural education: teacher utilization, attitudes, and knowledge. In Proceedings of the Central States 45th Annual Research Conference in Agricultural Education. Springfield, Il.

Pepple, J. D. (1982). Factors associated with teacher use and effectiveness of the Illinois rural core curriculum in agriculture (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1982). Dissertation Abstracts International, 43, 2859-A.

SPSS Inc. (1987). Statistical package for the social sciences (SPSS/PC+). Chicago, Illinois.

State Administrative Board (1990). Curriculum Overview (000). Michigan Agriscience and Natural Resources Curriculum. East Lansing, MI: Michigan Center for Career and Technical Education.

COOPERATIVE VOCATIONAL EDUCATION: WHAT WORKS?

James R. Stone III

University of Minnesota
1954 Buford Ave
St. Paul, MN 55108

David Stern
University of California-Berkeley

Charles Hopkins
University of Minnesota

Martin McMillion
Virginia Tech

Paper Presented at the
American Educatation Research Association
Annual Meeting - Atlanta, GA
April 1993

Recent research funded through the National Center for Research in Vocational Education has shown positive results from student participation in school-supervised work experience programs. Yet within these positive findings, there is a fair amount of variation in the responses of students who participate in such programs. Such variation may be the result of differences in how teachers operate their program.

Traditional texts on operating cooperative vocational education programs discuss the need for teachers to place students in jobs and then make regular visits to student job sites. Mason, Furtado, and Husted (1989) also discuss the need for training plans, regular job evaluation, and the importance of connecting in-class work to on-the-job work. It is these and related dimensions that we speculate may be cause of the variation among students in school-supervised work experience programs.

Objectives

This study was designed to examine the relationship between how teachers operate school-supervised work experience programs and student outcomes related to career and social maturity, work autonomy, and the costs and benefits student's associate with their work (see Stone, Stern, Hopkins, and McMillion, 1990).

Conceptual Base and Related Literature

It has been estimated that more than 80% of high school students have some kind of paid work experience by the time they graduate from high school (Hopkins, Stone, Stern, & McMillion, 1989). We also know that most work in jobs that are not connected to their program of study in school. Estimates vary, but no more than eight percent of students are enrolled in programs designed to connect school and work usually referred to as COOP (GAO, 1991). This information comes at a time when there is a growing body of literature that suggests that such participation contributes to desirable social and economic outcomes.

In previous research reported elsewhere (see Hopkins, Stone, Stern, & McMillion, 1989; Stone, Stern, Hopkins, and McMillion, 1990) using the LEARNING THROUGH SCHOOL-BASED WORK EXPERIENCE (LSBWE) data base, students enrolled in school-supervised work experience programs (primarily COOP) reported more frequently that they used academic skills more than their peers who worked in similar jobs that were unassociated with a school program. These same students reported more positive career and social maturity than their non-supervised peers. They also more frequently indicated that their jobs were of higher quality. This job-quality connection with COOP was reinforced in a more recent analysis of the LSBWE data base that found the only consistent predictor of job quality was COOP participation (Stern, Hopkins, Stone, McMillion, 1991).

Further analysis of the LSBWE data base indicates that the findings addressed thus far are not the result of systematic bias resulting from the kind of student who enrolls in COOP. Stone, Stern, Hopkins, and McMillion (1992) found only weak a priori differences between the three groups of interest. The results of this study support earlier evidence that suggests students who choose to participate in cooperative vocational education are not systematically different from their peers on personal characteristics.

As a result of the series of analyses of the LSBWE data base, we find that participation in cooperative education is important in developing work attitudes and behaviors desired by employers. Yet there is variability within the COOP students. This suggests that there may be differences in program structure and operations worth investigating.

Little research has addressed the specific, program features or structural characteristics that might contribute to these outcomes. McKinney and Halasz (1981) combined existing data, eight case studies, and a review of literature to identify three categories of factors affecting job placement: community characteristics, program characteristics, and labor market factors. While their study did not control for intensity or duration of program participation, or student demographics it does suggest the need to pay attention to programmatic relationships to the outcomes of interest.

This study was designed to examine the effects of program quality. Building on the earlier work of Stone et. al. (1990), we sought to examine the relationships between the quality of the programs that link school and work and the dimensions on which school-supervised working students differed from non-school supervised working students employed in similar jobs. The specific question of interest in this study can be stated as follows:

Is the quality of the school-supervised work experience program related to the differences found between school-supervised working students and non-school school supervised working students on the dimensions of:

Career and social maturity
Use of academic skills in the workplace
Costs and benefits of working
Perceived relationship between work and school
Job quality

Methods

The sample for this study includes all seniors who were participants in the National Center for Research in Vocational Education Longitudinal Study and were enrolled in a school-supervised work experience program (N=111). The data were derived from the National Center for Research in Vocational Education study, "Learning through school-based work-experience programs (LSBWE)." This study included schools in five sites. The choice of sites was based on prior knowledge of programs with reputations for successful school-supervised work experience programs. The five sites included two magnet schools in an industrial midwest city, a comprehensive school district (four schools) in an upper midwest state and in a mid-Atlantic state (four comprehensive schools and a regional vocational center), an automotive magnet school in a major east coast city, and a comprehensive high school in a rural southern county.

As defined for this study, school supervised programs included business education, marketing education, entrepreneurship, volunteer program, trade and technical education. In addition, students who participated in "live shop" programs - automotive and school store were included.

A continual problem is survey research is the issue of the representativeness of the sample. In interpreting the results of this study, it is important to recognize that the sample schools are not a probability sample of U.S. high schools. Schools were chosen because they represented "schools like these" that offered exemplary school-supervised work experience programs. With respect to the students who participated in the study, Stern, Stone, Hopkins, and McMillion (1990) concluded that NCRVE sample closely resembles students in another larger study that employed a probability sample: Monitoring the Future (Bachman, Johnston, and O'Malley, 1984). For more detail on this data base see Stone et al (1990).

Variables in the Study

The variables included in the analyses for this paper included all those on which the school supervised working students differed from their non-school supervised peers. As noted in Stone et. al. (1990) these included use of academic skills, a greater degree of positive career and social maturity, jobs of higher quality, and a greater perceived relationship between school-based learning and work-based learning. In addition, there were a series of variables measuring work attitudes and values for total of 72 variables.

The dependent variable in these analyses was the quality of the program that connected students work to school. Students responded to a series of questions concerning the program structure and operations that included:

1. teachers regularly visited the job site
2. training plan developed by supervisory & teacher
3. teacher evaluated job performance
4. job placement was controlled by the teacher
5. student required to find job to get into program
6. requirements for program/class match with the job
7. teacher talks about students' jobs in the classroom
8. student can discuss job-related problems in class
9. job relates well to students' school program

The survey participants responded to the items above using a scale of (1) Not True At All to (5) Very True. The variables, ProgQual, was created by summing the responses to the nine items (item #5 was assigned a negative sign in the equation). Depending on the variable set, correlational analysis, multi-correlational analyses, or one-way ANOVAs were used in the analysis.

Results

Five dimensions were of interest in this study: career and social maturity, use of academic skills in the workplace, costs and benefits of working, perceived relationship between work and school, and job quality.

Career and Social Maturity

A series of One-way ANOVAs were used to determine the relationship between program quality (a continuous variable) and twelve dimensions of career and social maturity (dichotomous variables). These dimensions addressed the reasons for working and the relationship between the job and the students' career choice. There were no differences on any dimension related to program quality.

A shorter series of bivariate correlation analyses found that of the twelve attitude items tested (scaled 1=strongly agreed to 5=strongly disagree), three were related to program quality at $p \leq .01$. These included questions about desired characteristics in future full time jobs. Higher program quality was positively associated with a desire for jobs that would be interesting ($r=.60$), where there is a chance for advancement ($r=.91$), and where one's skills and abilities would be used ($r=.91$).

Use of Academic Skills on the Job

There was no relationship between program quality and a variety of measures of use of academic skills (e.g. use of writing, reading, math) on the job.

Costs and Benefits of Working

Students were asked about what the kind of skills they learned by working. Of seventeen dimensions tested, higher program quality was positively associated with nine ($p \leq .05$).

These included learning to:

Follow directions (r=.44)

Be on time (r=.49)

Strive to do well (r=.50)

Learn how to learn (r=.44)

Learn to do things well (r=.50)

In addition, students in higher quality programs were more likely to believe their job taught them new skills (r=.45) and that what they learned would be useful in the future (r=.34). Finally, higher program quality was positively associated with students who believed their jobs helped learn what subjects they did or did not like in school (r=.55).

Students in higher quality programs were also more likely to recognize the costs associated with combining school and work. Higher program quality was positively associated with the perception that there was too much to do every thing well (r=.31); there was less time for homework (r=.43); and that it was difficult to get to school on time (r=.38).

Perceived Relationship Between Work and School

Higher program quality was positively associated with seven of the seven dimensions tested related to students' perception of the relationship of their work to their schooling. The seven dimensions were:

Job uses skills and abilities (r=.42)

Job uses special skills learned in school (r=.52)

Practice on the job what I learned in school (r=.47)

School learning helps on the job (r=.55)

Job provides information useful in school studies (r=.55)

Students talk about their job in class (r=.44)

Contribute more to class because of my job (r=.55)

Job Quality

Five of the ten dimensions of job quality examined were associated with higher program quality. Three of these were positively associated: the work is meaningful (r=.21); the job is challenging (r=.26); the amount of control over the work done (r=.19). However, higher program quality was also associated with student perceptions that they were unfairly treated by their supervisors (r=.22) and that they were unclear about what to do at times.

Discussion

Cooperative vocational education has a long history and a cadre of advocates who argue its value and its critics who argue it is, at best, a marginal program. To an extent, the critics have a point, it serves few students in secondary and pre-baccalaureate education. The evidence of the value of coop is beginning to emerge but we no little of why it might be valuable.

The results of this study do suggest that quality programs - programs operated in the way they should be (according to the traditional literature) - do make a difference. Quality programs help students "connect to their continuum" (my apologies to John Dewey). More directly, these findings suggest that quality programs help students make the connection between school-based learning and work-based learning. The importance of this connection has recently been re-confirmed by cognitive psychology (Berryman & Bailey, 1992; Resnick, 1989).

Program quality also appears to be connected to specific learnings students acquire on the job. Many of the dimensions relate closely to what the SCANS Commission (1991) has been advocating as necessary skills for all workers (e.g., learning to learn on the job) as well as more traditional desirable work values (e.g., learning the importance of being on time).

Caveats

These findings should be viewed as a work in progress that builds on previous analyses of a longitudinal study of the effects of school-supervised work experience. The sample of 111 represents only the initial schools in study. As other data is made available, these analyses will be repeated. A further caution is on the creation of the construct "program quality." Further analyses is warranted to determine if there is a single construct or if it is multi-dimensional. A last caution is in the use of correlational data. There is every likelihood that multicollinearity is present amongst some of the variables examined here. Future analyses will need to rely on more sophisticated multi-correlational analyses.

References

Bachman, J.G., Johnston, L.D. and O'Malley,P.M. (1984). Monitoring the Future. Ann Arbor, MI: Survey Research Center, University of Michigan.

Bishop, J., Blakemore, A, & Low, S. (1985). High school graduates in the labor market: A comparison of the class of 1972 and the class of 1980. Columbus, OH: Ohio State University, National Center for Research in Vocational Education.

Desy, J., Campbell, P.B., and Gardner, J.A. (1986). High school vocational education experiences: In school and in the labor market. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University.

General Accounting Office (GAO) (1991). Transition from school to work: Linking education and worksite training. Washington, D.C.: Author.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Grablowsky, J.(1979). Multivariate data analysis with readings. Tulsa, OK: Petroleum.

Hopkins, C, Stern, D, Stone, J.R. III, McMillion, M. (1989). Learning from school-based work experience programs. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.

Herrnstadt, I., Horowitz, M., Sum, A. (1979) The transition from school to work: The contribution of cooperative education programs at the secondary level. Boston: Northeastern University, Department of Economics.

Lewis, M, Gardner, J, & Seitz, P. (1983). High school work experience and its effects. Columbus, OH: Ohio State University, The National Center for Research in Vocational Education.

Mason, R.E., Furtado, L.T., Husted, S.W. (1989) Cooperative Occupational Education. Danville, IL: Interstate Printers & Publishers, Inc.

Stern, Stone, Hopkins, and McMillion (1990). Quality of students' work experience and orientation toward work. Youth and Society, 22(2), pp.263-282.

Stern, D., Hopkins, C.H., Stone, J.R., and McMillion, M. (March, 1991). Which students get better jobs? Preliminary results from a survey of working students in high schools. Paper presented at the Annual Meeting of the American Education Research Association, Chicago.

Stone, J.R. III and Wang, Y. (1990). The influence of participation in vocational education on expressed career choice in a related occupation. The Journal of Vocational Education Research, 15,(1), 41-55.

Stone, J.R. III, Stern, D., Hopkins, C.H., and McMillion. (1990). Adolescents'perceptions of their work: School supervised and non-school supervised. Journal of Vocational Education Research. 15(2), 31-53.